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TUTORING MULTIPLY-HANDICAPPED CHILDREN

by

PATRICIA ANN OSBORNE

A THESIS

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FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled: Tutoring Multiply-Handicapped Children submitted by Patricia A. Osborne in partial fulfilment of the requirements for the degree of Master of Education.

M. R. Lawson
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Date Aug. 30, 1974

ABSTRACT

The purpose of this research was to design an exploratory study to determine the efficacy of using elementary children as tutors for younger handicapped children following a systematic tutoring approach. The methods used in the present study were behavior modification techniques because previous research had indicated that paraprofessionals were able to learn the methods involved in behavior management. There was also considerable evidence in previous research to suggest that behavior modification was an effective tutoring approach in the training of retarded children.

Ten sixth grade girls from a regular elementary school were trained in very basic behavior modification techniques and in the recording of observed data to tutor five multiply-handicapped children in basic self-help behaviors and, in two, instances simple academic skills. Over a period of 3 1/2 months, thirty-two, twenty minute tutoring sessions were held. Motivation of the sixth grade tutors was maintained by a token system established by the experimenter.

An individualized program was arranged for each tutee on the basis of a pre-program questionnaire completed by the tutee's parents and/or in consultation with the homeroom teacher. The target behaviors comprising any program were broken into substeps with each successive substep becoming progressively more difficult.

The design of the tutoring program was a Skinnerian one in which results of the treatment periods (periods in which reinforcement was given for correct responses) were compared to replicated baseline measures. The subjects, therefore, were used as their own controls.

Results of the daily tutoring program were presented in case study form for each of the five tutees. The results of the specific tutoring for each tutee was presented in terms of (a) number of correct and incorrect responses per tutoring session, (b) percentage of correct responses per tutoring session, (c) cumulative number of correct and incorrect responses per tutoring session, (d) the weighted (by substep number) percentage correct for each target skill in a tutee's program, and (e) results of the progress test (situational-type of test in which attainment of the final goal behavior was assessed). In addition to the daily observation records a reliability check was made on the recording of data for each of the tutors, tests assessing basic knowledge of behavioral principles were administered on a pre- and post-condition to determine if tutoring experience significantly increased understanding of behavior modification techniques, and a post-program questionnaire was completed by the tutees' parents.

Results indicated that children can be reasonably effective tutors of handicapped children using behavior modification techniques. However, many questions both in methodology and in application were raised by this research. Therefore, many of the theoretical and practical implications were discussed in this paper.

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CHAPTER I

INTRODUCTION

The Problem

The trend in the special education of trainable mentally retarded and many multiply-handicapped youngsters is rapidly diverging from traditional institutionalization. As early as 1960, Robinson, DeMarche, and Wagle stated that most communities felt that institutionalization was less beneficial than home care for severely retarded youngsters. The Robinson et al. paper saw residential homes as the treatment center for children who by necessity must be removed from the community. However, in 1960 there were still few local or community centers for trainable retarded children. The Blair Report, Mental Health in Alberta (1968) outlined some of the basic advantages of decentralizing services for severely handicapped children: (a) there would be a maintenance of family ties during the critical years of a child's growth, (b) greater community tolerance for the handicapped individual would develop, and (c) there would be greater support for rehabilitative employment efforts.

As this trend toward decentralization of services continues, more and more children who were previously sent to large residential schools are being kept in community settings. The family and community are then faced with the problem of finding an educational facility in their locale that will serve the needs of the severely handicapped children of little or no academic talents. There are

too few day schools and/or day care centers to accommodate them. The family and, to some extent the community, therefore, are confronted with the sometimes insurmountable task of teaching these children to develop some degree of independence.

The task of teaching these handicapped children involves the crucial problem of finding enough sufficiently trained individuals within a community to provide services for such children. Oftentimes professional individuals are not available in sufficient numbers to staff a program requiring considerable time and individual attention (as would be needed for a program for multiply-handicapped and severely retarded children). In many instances these professionals are utilized in administrative or supervisory types of roles. Many programs (especially in rural and inner city settings) lack professional people because of economic and geographical reasons. Provincial and state regulations often impose relatively high qualifications for their social welfare agencies. Also, many communities are able to hire only a few professional individuals because of limited budgets. Therefore, in many community centers case load is high, and, consequently, the individual attention that is needed in certain programs suffers.

It would seem that some programs based in the community could be implemented efficiently by a non-professional staff and/or volunteer workers under professional supervision. The benefits of such a program would be: (a) more social agencies in all demographic areas would receive the services of professionals, (b) people indigenous to an area would be hired to alleviate mental health

problems in their own communities, and (c) individuals needing assistance would be aided in a home-based center, instead of being referred to a larger, more centralized facility. This idea is echoed by Blair (1968) in his report, Mental Health in Alberta:

> The amount of effort needed for success in mental health programs lies far beyond the scope of the so-called "health professions," like psychiatry, general medicine, nursing, social work, and psychology. It commands the attention of several departments of government, other professions notably education and the clergy, industry, social agencies in the community and the public at large. Mental health is really everybody's business (p. 17).

Blair in this same report urges the employment of individuals without formal qualifications to carry out some of the tasks that do not require special training.

Children with severe multiple-handicaps and severe mental retardation have formerly been almost exclusively the responsibility of professionals, usually medical personnel. These children traditionally receive nursing-type care in large centralized institutions. Only recently have they been seen as the responsibility of the schools on this continent. In the United States this feeling has been expressed in many legislative acts. For example, legislation drawn up for the State of Indiana (House Enrolled Act, Chapter 396, Acts of 1969), stated that the education of all children is the responsibility of the local school boards. The statute set up guidelines for these services (including early education), and set a deadline (1973) for the implementation of these plans. In Canada, this trend is growing. In 1968, the Committee on the Intellectually Handicapped for the Blair Commission Report stated that trainable

retarded children should be the responsibility of the Department of Education, and that educational programs should be implemented by the local school boards.

The Commission on Emotional and Learning Disorders in Children (One Million Children, 1970) also stressed the importance for community and local services for children. It recommended "that educational authorities be financially responsible for the education of all children in their community (p. 143)."

Schools are primarily community-based institutions. It would seem that they, too, could benefit from a trained paraprofessional staff to be used as teacher aides and tutors to maximize the amount of individual attention received by each child. In a special classroom, this individualized attention is especially important because of the heterogeneity of handicaps usually present in the children.

The present study was designed to train a group of non-professionals to serve effectively as tutors for mentally retarded children. The paraprofessionals in this study were elementary school girls of normal intelligence. It was of interest to the experimenter to determine if normal children could be used as effective tutors for younger retarded children by applying a systematic method of tutoring and recording daily progress. The girls were trained in the techniques of behavior modification, tutoring the children on basic self-help skills and, in two cases, some simple academic skills.

Related Research: The Use Of Paraprofessionals

The use of paraprofessionals as aides in the educational and

social welfare services is receiving new impetus from the increased interest in the techniques of behavior management. This trend in the use of paraprofessionals was first utilized effectively in large residential hospitals for mentally retarded and psychiatric patients. For example, Ayllon and Michael (1965) used about one hundred psychiatric nurses to implement a behavior modification study in a large mental hospital. They attempted to decrease the amount of certain objectionable behaviors that occurred in the patients by selective attention and the giving of rewards (e.g., cigarettes, privileges, etc.). Mattos (1967) used attendants in an institution for the mentally retarded as behavior therapists to measure interaction between staff and residents. Guess, Rutherford, and Smith (1970), likewise, used paraprofessionals to teach language skills to institutionalized mentally retarded youngsters. Bensberg (1965) has developed a handbook for ward personnel in the techniques used in behavioral engineering. The Mattos (1967), Guess et al. (1970), and Bensberg (1965) studies each emphasized the strengthening of desirable behaviors (i.e., staff-inmate interaction, verbal behavior, and self-help skills, respectively), instead of attempting to decrease inappropriate behaviors.

The most obvious resource in the training and education of children are their parents. This valuable source of manpower cannot be overlooked especially in the case of severely handicapped children. If no school placement is available for a child, by necessity, the parents become solely responsible for his education. Most studies using parents as behavioral therapists are deceleration-types of

studies; that is, they attempt to decrease certain objectionable behaviors. In most of these studies, however, some attempts were made to reinforce appropriate behaviors that were incompatible with the objectionable behaviors. Many of these studies were administered in a clinic, or the child's home with supervision from clinic personnel. These studies using parents as behavioral therapists were carried out in the last half of the sixties. Russo (1964) showed that parents can be used as behavioral engineers in the management of behavior problems in their own home instead of a clinical situation. Wahler, Winkel, Peterson, and Morrison (1965) used a playschool environment to teach parents to eliminate objectionable behaviors in their problem children. Allen and Harris (1966), Hawkins, Peterson, Schweid, and Bijou (1966) and Zeilberger, Sampsen, and Sloan, Jr. (1968) all developed home-based programs to help parents manage problem behaviors (i.e., excessive scratching, aggressive behaviors, bossing and yelling, respectively) in their children. The Allen and Harris (1966) study was basically run on a token system, while the Hawkins et al. (1966) and the Zeilberger et al. (1968) study used extinction and time-out procedures. In a later study, Gardner (1971) used the parents of a preteen girl to successfully eliminate psychogenic seizures by using extinction techniques.

An interesting study was performed by Hirsh and Walder (1965) again using mothers as behavioral therapists for eliminating problem behaviors in their own severely disturbed children. This study was entirely conducted in the home without close supervision from the experimenters. The reliability of the data collected by these

mothers, therefore, is questionable.

Besides these deceleration types of studies, a few acceleration studies have also been reported in the literature. These latter programs have emphasized the strengthening of positive, adaptive types of behavior. Terdal and Buell (1969) have set down some guidelines for teaching parents in the habit-training of young trainable retarded children. Risley (1966) successfully used parents as aides in developing imitative behavior in their young deviant children. Kroth, Whelan, and Stables (1970) also utilized social approval of parents to reinforce appropriate academic and non-academic behavior of their emotionally disturbed children in the classroom.

Recently many manuals of behavior modification techniques have been published specifically for parents to utilize in their homes. Smith and Smith (1966), Becker (1971), and Tymchuk (1972) all contain brief discussions on behavior management principles, work pages, and sample situations. The Becker (1971) and Tymchuk (1972) manuals also contain instructions on graphing, recording and the actual setting up of programs in the home.

Another source of manpower for programs for the severely handicapped child is other children. This reservoir of volunteers is virtually untapped with only a few studies having been reported which used children as behavior therapists for other children. Farris, Kent, and Henderson (1970) showed that grade school and junior high school children (8-12 yrs.) can be taught operant techniques in a laboratory setting using animals as subjects. Whalen and Henker (1969) used retarded adolescents (IQ 48-54) as tutors for

non-verbal younger children (IQ 19-37). The latter study, conducted in an institution for the retarded, used a combination of modeling and reinforcement techniques to train the tutors, gradually fading out the experimenter's prompts. It was found that the adolescents became quite proficient in their tutoring of verbal behaviors, and a few even helped in the training of new tutors. It is also interesting to note that becoming a "special teacher" seemed to considerably increase the self-confidence of the tutors, so that subsequently many of them were placed in foster homes.

Surratt, Ulrich, and Hawkins (1969) explored the possibility of using a fifth grade student as a behavioral engineer for first grade pupils. Four first graders who had problems in focusing their attention on any task, and who often engaged in inappropriate behaviors, were rewarded for any "working behavior" (i.e., looking at the blackboard; counting on fingers, pencils, crayons, etc.; and writing on paper). When the fifth grader found them engaging in these behaviors, he turned on a light by their desk from a central console. The first graders received a reward (special privelege) for a pre-specified number of minutes that the light was on. The fifth grader on a token system himself, was also in charge of telling the younger children whether or not they had earned the reward. Crozier (1972) successfully used sixth graders as tutors of second graders in reading. She used precision teaching techniques -- an outgrowth of behavior therapy.

In summary, most of the research on the efficacy of using paraprofessionals as behavioral therapists has been implemented with ward personnel in large institutions, or with parents as therapists

for their own children. Most of these studies were deceleration types of studies in which elimination of objectionable behaviors was attempted. Few studies have been conducted in which children were used as tutors for younger children. It is significant to note that all of the studies in which children were used as behavior therapists were acceleration types of studies. The present study was innovative in that it used normal children as tutors for severely retarded and/or multiply-handicapped youngsters. It also was an acceleration type of study in that it attempted to train the retarded children in self-help skills and selected academic skills. It differed from the other studies that utilized children as behavior therapists by following a structured step-by-step program, instead of systematically reinforcing behaviors that might occur randomly during the therapy session.

Related Research: Use Of Behavior Modification With The Retarded

The employment of behavior modification techniques has been found useful in the training of certain self-help skills in retarded children. Greene (1966), Newas and Brown (1970), and Watson (1967) presented comprehensive reviews on the research and techniques used in the operant conditioning of the severely and profoundly retarded. Minge and Ball (1967) used six, institutionalized retarded girls in a study of programmed self-help skills (i.e., attention, coming to the technician, sitting down, remaining seated, standing up, removing shirt or dress, removing pants, removing socks, putting on shirt or dress, putting on pants, and putting on socks). These self-help

skills were broken down into several sub-tasks or steps. When the first steps were mastered, the cues and gestures used were faded out until fairly complex responses were required for reinforcement.

In a similar study Cameron and Crozier (1970) used fourteen mongoloid children in a programmed self-help project. Basically the same skills on which the Minge and Ball (1967) study focussed were included in the program for these children. One innovation in the Cameron and Crozier (1970) study was that their program was not carried out in an institution or clinical environment, but rather in a day-school for trainable children, as part of their daily routine. In addition, the Cameron and Crozier (1970) study included a matched control group of subjects with which to compare results. Roos and Oliver (1969), while working in an institution for the retarded, also included a control group (receiving no treatment) and a placebo group (receiving special education training) to compare with their experimental group (receiving behavior therapy).

The Cassell and Colwell (1965) study used seven profoundly retarded boys (CA--7.7-15.5; MA--0.8-1.2) in a self-help training program in a cottage environment of a large institution, using attendants as behavior technicians. After this initial study, behavior modification techniques were utilized for the whole cottage. It was concluded that behavior modification techniques can be effectively learned by ward personnel; and that residents of these cottages can benefit by behavioral shaping of self-help skills, even when these residents possess almost nothing in the way of self-care skills. Breland (1965) outlined and illustrated these procedures for training

the severely and profoundly retarded in the area of self-help skills.

Blackwood, Horrocks, Keele, Hundziak, and Hettig (1967) instituted a behavioral modification program at a state institution for the retarded, also, using nurses and attendants as therapists. Some of the cases mentioned in this study were attempts to shape appropriate responses (i.e., correct eating behaviors and to come when called). However, most of the studies cited dealt with the elimination of inappropriate or objectionable behaviors, such as, fear of hair cutting, aversion to stair descending, and repeated vomiting. The first two inappropriate behaviors were eliminated by desensitization techniques rather than a traditional operant method. It is interesting to note that these children were maintained in a special-care unit of the institution with a ratio of one staff member/ten children. This unit also had access to a full-time psychiatrist, physician, and psychologist. However, a few programs for the children had to be terminated on the basis of economic feasibility and the amount of time necessary to maintain control over specific responses.

The teaching of self-help skills to institutionalized retarded children was also attempted by Hundziak, Maurer, and Watson, Jr. (1971), Whitney and Barnard (1971), and Esposito (1971). The Hundziak et al. (1971) study attempted the toilet training of some severely retarded boys in a large unit of a state hospital. They contrasted operant techniques with conventional toilet training techniques, and found the operant methods to be more effective. The Whitney and Barnard (1971) program focussed primarily on the eating habits of an adolescent girl. Esposito (1971) concentrated on stair-ascending

and descending behaviors in retarded children. Kreitman, Corbin, and Bell (1969) successfully instituted a token system in a classroom of eight trainable retarded children, 8-11 years of age. A teacher and a full-time teacher's aide carried out this program in their classroom. Again the major disadvantage listed for this type of project was the time and considerable expense involved in individual training.

A few studies have used behavior modification to try to teach language skills. Risley (1966), using behavior principles, developed imitative verbal behaviors in young deviant children. Crozier (1970) attempted to enlarge the receptive vocabulary of a sample of young mongoloid children with operant techniques.

It is evident from these studies that behavior modification techniques have proven effective with severely and profoundly retarded youngsters, both in the training of self-help skills and in the elimination of inappropriate behaviors. However, it is also evident that to have an effective program utilizing behavioral engineering techniques, it is necessary to have sufficiently trained manpower to staff such projects. If this individual attention is not present, some responses become very difficult to control. For example, toilet training requires continuous observation for any signs of wetness, extensive data collecting to determine the frequency of urination, and the actual placement of the child on the toilet at certain intervals.

The example above illustrates the necessity for individual attention in the use of behavior modification methods. Therefore, if such techniques are to prove useful for a large number of retardates,

they must prove feasible from an economic and time standpoint. The problem is, basically, to reduce the number of children that each tutor must teach. The idea of using children as tutors seems to be economically possible in that these children would essentially serve as volunteers. Payment could be arranged in the form of special privileges, small rewards, some sort of course credit, or special awards or recognition from the school. Anderson (1971) advocated that the tutoring of other children should be incorporated as a part of routine school work. Goodman (1971) suggested using tutoring as an elective credit in the schools. Cloward (1967) used a different approach by actually paying his tutors. He utilized tenth and eleventh graders as tutors for fourth and fifth graders in slum areas. The tutors were paid $11.00/week for six hours of tutoring and two hours of inservice training. Even this monetary system appears to be more economically feasible than the hiring of many professionals to administer such a program. In the case of junior and senior high school students, the salary could become a valuable motivating device, since in many cases these adolescents are often hard pressed to find after-school employment.

It would appear that this type of tutoring program would be a valuable addition to the normal child's social studies or health class. Social awareness, the understanding of people who are different, and the feeling of self-accomplishment are important traits to instill in any child. However, there are no curriculums based on these ideals - experience remains the best teacher.

The availability of children does not seem to be a major problem.

In most classrooms there is one teacher to approximately thirty children. Even in special classrooms there are still more children available to carry on some of the work as special tutors for less advanced children. In large day schools or institutions for the retarded, older, more advanced pupils could help teachers of the younger children. Many classrooms for exceptional children exist as a special unit in a regular public or separate school. This arrangement is ideal for obtaining older, more intelligent children for tutors. It would appear that even schools that serve an entirely handicapped population can effectively utilize the resources of normal children in the community. This would be especially feasible in areas that have large, central locations zoned for schooling, as in many suburban areas. The present study endeavored to test the effectiveness of such an arrangement, where older children from another school in the vicinity served as tutors for children enrolled in a day school for the retarded.

In summary, behavior modification techniques do appear to be a promising method of teaching retarded and handicapped children, both in the strengthening of adaptive behaviors and in the elimination of objectionable behaviors. However, the importance of highly individualized attention and detailed observational techniques in behavior modification programs necessitates that there be a sufficient number of trained personnel to implement such programs. The use of paraprofessionals as behavior therapists would alleviate some of the money and time problems associated with the organization of highly individualized programs. The present study investigates the

possibility of using children as behavior therapists for other children, on the assumption that children are the most available resource of manpower in the educational system. The expense of training the children as tutors and the cost of the actual execution of such a tutoring program would appear to be relatively modest, considering the potential benefits to both tutors and tutees of children. The fact that children would function as basically a volunteer force (receiving only school credit, or small monetary or other types of rewards) would make the arrangement even more economically feasible. The following chapters outline in detail the organization and outcomes of an exploratory program using normal children as behavior therapists for multiply-handicapped youngsters.

CHAPTER II

METHOD

Personnel

Experimenter. The experimenter in the present study was a 24-year old woman, specializing in Special Education. The experimenter's previous experience involved running subjects and collecting data in a cognition laboratory. She also had spent some time in the collection of observational types of data in a nursery school. Both of these previous studies are conducted by faculty members of the Psychology Department at the University of Alberta. The experimenter had studied extensively the physical and psychological characteristics of the retarded before initiating this research. In addition, she had considerable knowledge of behavior modification techniques; and prior to the commencement of this project had attended a class, which was intended to instruct parents in behavior management techniques. The experimenter served as trainer for the sixth grade girls, supervisor during the tutoring sessions, program coordinator, and occasionally as a reliability checker for the data collected by the tutors.

Assistants. There were two assistants hired at different times during the program. The first assistant worked for the first nine weeks of the project. The second assistant was hired for the last three weeks when the first assistant was unable to continue for the duration of the program.

The first assistant was a 27 year old woman with four years of experience in teaching second and third graders in the California school system. She also had experience in the running of subjects in the Verbal Learning Laboratory, Department of Psychology, University of Alberta. This project was her first actual contact with behavior modification techniques.

The second assistant was a 26 year old woman. She had no formal training with children or behavior modification techniques. However, she did have three years of experience in the running of subjects and in data collection at the Verbal Learning Laboratory, Department of Psychology, University of Alberta and at the Alberta Alcoholism and Drug Abuse Commission.

The assistants were responsible for the general supervision of the children, and also for taking reliability checks during the training sessions. In a few instances the assistants served as data collectors when a sixth grade tutor was absent.

Tutors. The tutors were 10 sixth grade girls attending Our Lady of Perpetual Help School in Sherwood Park, Alberta. The mean chronological age at the outset of the program was 11.8, with a range of 11.3 to 12.1. The girls were selected by their principal from a list of volunteers and permission was obtained from their parents. There were no boys selected because of their involvement in a floor hockey league during their lunch hour (time of the tutoring sessions). Although no intellectual assessments were available for the girls, it was assumed by their actual selection and their

performance that they were of average or above average intelligence. All the girls were from middle income families.

Tutees. The tutees were five retarded youngsters (3 girls, 2 boys) attending the Robin Hood School for Retarded Children (a day school) in Sherwood Park, Alberta. Their mean chronological age at the outset of the program was 8.9, with a range of 7.9 to 9.8. No psychological assessment reports were available for four of the children, but it was assumed by their behavior and their admission to the Robin Hood School that they fell in the trainable category (IQ: 25-50). One girl was tested (Stanford-Binet, LM) by the experimenter at the termination of the study. She scored an IQ of 57, borderline between the trainable and educable categories. She also seemed to be the brightest of the five children.

The five children were chosen by the principal of the Robin Hood School to participate in the program. Three of the children had spastic cerebral palsy compounded with mental retardation. Two of these children (a boy and girl) were confined to wheelchairs. The third (a girl) had learned to scoot herself along the floor, or to propel herself in a small chair with wheels. She also was learning how to use crutches as a means of locomotion. A fourth tutee (boy) was diagnosed as possessing mongolism (Down's Syndrome). The fifth tutee (a girl) was diagnosed as having mental retardation due to cranial anomalies of unknown etiology.

Four of the children were from middle income families in Sherwood Park or Edmonton, Alberta. The fifth child was a girl of Eskimo origin from the Northwest Territories, Canada. She was currently

residing in a foster home in Edmonton with four other retarded youngsters. (A more detailed description of each of these five children will follow.)

Motivation and the Training of the Tutors

As was previously mentioned, the tutors were ten sixth grade girls attending a regular elementary school. Because of the physical disabilities of the multiply-handicapped children, it was necessary to locate the tutoring program in a community in which both types of schools (regular elementary and the special education school) were in close proximity. The community of Sherwood Park, Alberta seemed ideal for the purposes of the present study since the elementary school was located across the street from the school for the retarded children. (See Appendix A for copies of the letters sent to Our Lady of Perpetual Help School and to the Robin Hood School for Retarded Children explaining the purposes of the present study.)

Since the only free time available to the tutors was during their lunch hour, it was arranged that the tutoring sessions would last from 12:00 noon to 12:30. From 12:30 to 12:55 the girls ate their lunches with their tutees. All the tutoring sessions took place within the Robin Hood School for Retarded Children which was directly across the street from Our Lady of Perpetual Help School. Since space was limited in the Robin Hood School, a section of the stage located in the gymnasium was set aside for this program. Each set of children (there were five sets, each consisting of two tutors and one tutee) was assigned work in a cubicle with floor dimensions

of approximately 5 ft. by 6 ft. Each of the cubicles had the front side open and separation from the adjacent cubicle by a plywood or panel screen. In each booth there was a small table and chairs for the two tutors and the tutee. Any other equipment that was needed by the tutors was also kept in these booths.

Although these physical arrangements did provide some reduction in distractions during the tutoring sessions, they were far from ideal. The noise level sometimes became quite high, and in a few cases the tutees were able to see the other tutors, for example when their programs dictated that they stand specified distances away from their tutees to issue certain demands. Tables were set up in the gym for lunch and for the initial training sessions for the tutors.

The tutors' training was over a period of nine days. During this time the girls were introduced to the basic principles of behavior modification. Few descriptions in the literature give a detailed account of training programs for behavior therapists. Ulman (1971), Poser (1967), and Walder, Cohen, Breiter, Daston, Hirch, and Liebowitz (1971), although concerned with the training of behavior therapists, dealt mainly in generalities, not with specific training procedures. The few manuals that have been prepared for paraprofessionals (Bensberg, 1965; Smith & Smith, 1966; Becker, 1971; and Tymchuk, 1972) were not seen as suitable for the present study because the methods of teaching bechavior modification techniques seemed to be based on the assumption that the therapist would normally be spending a great deal of time with the tutee in order to practice the exercises and observe the behavior principles presented

in the text. In the present study, the tutors had only one-half hour to observe and work with their tutees. It was also necessary to steer away from the written homework practices recommended in existing manuals, because the experimenter had assured the school authorities that this program would involve no after-school work.

Another problem in connection with the use of the training manuals was that the experimenter did not want to introduce the girls to principles used in punishment, or in the elimination of negative behaviors. This was done mainly because the present investigator thought it was desirable to present the program in a very positive light to the sixth grade tutors.

A special training program employing behavior modification techniques was designed for the sixth grade tutors. It was decided that by putting the sixth grade girls, themselves, on a token system, they could be effectively taught the principles of positive reinforcement through their own experiences with a type of reward system. A token system was also seen as an effective way to keep the motivation of the tutors high.

The token system was a simple one in which the tutors earned points for certain desirable behaviors during their training sessions, as well as during the tutoring sessions with the tutees. Points were given by the experimenter for attendance, tutoring of the retardec children, answering in class, and correct answers on tests. Bonus points were given for computing the percentages of correct and incorrect responses per tutoring session. Although the assignment of points was controlled by the experimenter, the girls were placed on an honor system

in the actual recording of their points, and any point that was not recorded was considered a lost point. (See Appendix D for a copy of the point-tallying sheet.) When a girl had accumulated fifty points, she was allowed to pick a reward from a list of rewards (determined by the tutors themselves). This list consisted of desired activities and material objects that would cost no more than $1.50. If a reward was desired that exceeded this limit, the girls were required to pay the extra amount, or earn extra points to make up the difference. All the rewards that were suggested by the tutors were subject to the final approval of the experimenter. Any reward that consisted of an activity, outing, or was of questionable nature (e.g., kittens, puppies) was also subject to parental permission. The most common rewards chosen by this group of girls consisted in outings with the experimenter (movies, picnics, horseback riding), sewing notions, money, and art supplies. It was also originally planned that when each girl earned fifty points, a group reward was to be given. In this respect, two parties were given for the girls--one halfway through the program and one at its termination. (See Appendix C for a detailed description of the training program for the tutors.)

Procedure

Experimental Design. The experimental design used in this program was a modified version of the ABACD design as described in Browning and Stover (1971, 98-100). In this design A is designated as the baseline period, and B,C,D are designated as treatment periods.

Using this design, one is able to compare successive treatment periods with a replicated baseline measure.[1] In a single subject design such as the present study, the subjects are used as their own control. By returning to baseline conditions subsequent changes in the frequency of desired behaviors (and/or the frequency of objectional behaviors) can indicate effectiveness of the treatment program. For example, if reinforcement for desired behaviors is used during the treatment period, and omitted during a return to baseline conditions, a decrement in the frequency of correct responses during the baseline measure could indicate the efficacy of the treatment. Likewise, an increment in correct responses when the treatment has been reinstated after a baseline measure, also would indicate treatment effectiveness.

The design used in the present project was a modification of the ABACD design. The first modification was a topological one in which experimental phases were given more mnemonic abbreviations (instead of ABACD) to correspond more directly to the terminology employed by the experimenter in the present study. For example, B1 and T1 replace the symbols A and B in referring to the first baseline and first treatment periods respectively. (All other symbols were modified in a similar manner.)

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[1]Technically speaking, it is impossible to totally replicate a baseline period after subjects have undergone any type of treatment. However, in this paradigm the intent is to reproduce initial baseline conditions as closely as possible with the realization that factors, such as, experience with the task and the relationship between the therapist and the subject cannot be controlled.

Two latency periods were also added - one during the first treatment period (T1), and the other following the third treatment period (T3). The first latency period (L1) was applied to coincide with the occurrence of Easter vacation in both school systems. This break in the treatment period was used to determine if the results obtained during the program would persist over time. After this latency period the conditions of Treatment 1 were reinstated to increase the frequency of correct responses to the level attained before the latency period. Likewise, the second latency period (L2) was followed by a situational-type of test (called a "progress test") to determine the permanence of results. This progress test was identical to the progress tests given at the termination of each major experimental division. It consisted of commanding the tutee to perform the final goal behavior, receiving only social rewards for a correct response. (For a more detailed description of the progress tests, see the section on Measurement and the Recording of Data, p. 26 .)

Also, in the present study the first treatment period (T1) and the third treatment period (T3) were essentially identical in procedure. Treatment 2(T2) in the present study was a medial condition between the Baseline (B1) conditions and Treatment 1 (T1) conditions. It was incorporated into the program in an attempt to assess the relative strength of the two reinforcers (food and praise) used during the project.

The entire study lasted 3 1/2 months (including the training session for the tutors). The experimental design described above was essentially Skinnerian, as recommended by Bijou, Peterson, Harris,

Allen, and Johnston (1969) and Gelfund and Hartman (1969) for studying children in their natural environment. Using this design, the program had eight major experimantal divisions.

1. Baseline 1 (B1) -- The tutors only commanded the children to do the target skill or behavior during the tutoring session. No food or social rewards were given for correct responses.
2. Treatment 1 (T1) -- The tutors instituted positive reinforcement principles into the tutoring sessions. Correct responses for a desired behavior were rewarded on a continuous schedule by food and social reinforcement.
3. Latency 1 (L1) -- For a one and one-half week period in which treatment was suspended to coincide with the occurrence of Easter break for both school systems.
4. Treatment 1 (T1) -- The continuation of Treatment 1 after Easter break was used to reinstate behaviors present before the Latency period.
5. Baseline 2 (B2) -- This was a return to the Baseline 1 procedures, in which no food or social rewards were given for appropriate or inappropriate responses.
6. Treatment 2 (T2) -- The tutors again used social rewards on a continuous schedule for correct behavior, but no food rewards were given. This treatment was used to assess the relative strength of the two reinforcers (food and social rewards).
7. Treatment 3 (T3) -- This was a return to conditions in

Treatment 1 in which correct responses for a desired behavior were rewarded on a continuous schedule by food and social rewards.

8. Latency 2 (L2) -- This was a period in which there was no contact among the tutors, tutees, and the experimenter to determine if the results obtained during the treatment periods would persist over time. This latency period was followed by a progress test to determine permanence of results.

(See Table 1 for a summary of the experimental design used in the present study.)

Measurement and the Recording of Data

Daily Records. Daily records during this project were recorded entirely by the sixth grade tutors. There were two methods of data collection. The first consisted of a daily record (See Appendix F). The daily record was used to record the number of correct and incorrect responses per tutoring session; and, also, to denote the behaviors that were worked on in any particular tutoring session. Each daily record sheet required the tutors to record which target skill was being counted, including the sub-step number for each different phase of a certain behavior. This allowed the experimenter to know exactly where each tutee was in his program. For each step in the program the correct and incorrect responses per session were tabulated. The tutors were instructed not to move ahead in their programs until they had elicited five correct responses in a row for any one behavioral sub-step. This criterion, although stricter than

TABLE 1. SUMMARY OF EXPERIMENTAL DESIGN

Experimental Phase	Brief Description	Duration	Tests (following Exp. Phase)
Baseline 1 (B1)	Tutees were not rewarded for correct behaviors either by food or social reward.	1 week	Progress Test
Treatment 1 (T1)	Tutees were rewarded on a continuous schedule for correct responses with food and social rewards.	2 1/2 weeks	Progress Test
Latency 1 (L1)	Treatment was suspended to coincide with Easter break in the school systems.	1 1/2 weeks	Progress Test
Treatment 1 (continued) (T1)	Treatment 1 was continued after Latency 1 to reinstate previous behaviors.	1 week	Progress Test
Baseline 2 (B2)	The conditions for Baseline 1 were reinstated - no food or social rewards were given for any responses.	1 week	Progress Test
Treatment 2 (T2)	Tutees received social rewards for correct responses, but no food rewards.	1 week	Progress Test
Treatment 3 (T3)	The conditions for Treatment 1 were reinstated - food and social rewards were given for correct responses.	2 weeks	Progress Test
Latency 2 (L2)	No contact was made during this period between various participants in the program, so as to test permanence of results over time.	20 days	Progress Test

a percentage (e.g., four out of five times correct), was used because of its simplicity to explain and its facility in being followed by the sixth grade tutors. A percentage-type of criterion would have increased the chances of errors in the following of the program. This stricter criterion was also enforced in order to safeguard against too lenient scoring by the tutors.

The counters were also required to state the time the session began and ended, and to name the tutor and recorder for that day. An additional section for percentages correct and incorrect was included for tutors or counters who desired extra points for their reward system. These two sections contained a formula (printed on each sheet) to facilitate the computation of each percentage (e.g., percentage correct = number correct/total number of responses x 100; percentage incorrect = 100 - percentage correct).

From these daily records four types of graphs for each tutee were constructed by the experimenter:

1. Number correct and number incorrect per tutoring session--This graph contained daily information on how much was accomplished each day of the program. It also gave an idea of the consistency of responses in any one child.
2. Percentage correct per tutoring session--This graph gave information concerning the general trend of improvement or no improvement during the program.
3. Cumulative number correct and incorrect per tutoring session--This graph contained the rate of correct and incorrect responses over the major experimental phases.

4. Weighted (by substep number) percentage of correct responses for each target skill per week of the program-- Each behavior (target skill) in each of the tutee's program was graphed separately. The number of correct and incorrect responses in each substep was weighted by the number of that substep. (For example, if 3 correct responses were listed at substep 4, the value of correct responses is recorded as 12. Values of incorrect responses are similarly computed.) A percentage of correct responses per week was then determined for each target skill, utilizing the weighted number correct divided by the weighted total number of responses. By weighting the number of correct and incorrect responses by substep number, a more concise measure of progress per target skill can be determined because not only are correct responses recorded, but the level of the correct responses is taken into account, as well as the number and level of incorrect responses (see Appendix R, p.228 for example).

Progress Tests. The second major method of data collection was in the form of a situational-type of test similar to that used by Cameron and Crozier (1970). These tests were termed "progress tests" in this project. A progress test was given at the end of each major experimental division, consisting of commanding the tutee to perform each of the goal (final) behaviors in their program, receiving only social rewards for appropriate responses. There were three trials for each separate target skill, and the tutee was scored either as "+" or "0" depending on how well his/her performance compared to

the criterion (as stated for each target skill on the progress sheet). If a tutee scored two pluses (+'s) out of the three trials, that particular skill was considered a "learned skill". For each progress test the number of learned skills was graphed. This gave the experimenter a more global picture of each tutee's progress towards his final goal in the program. (See Appendix G for the progress tests for each of the five tutees.)

Other Measures

Reliability Checks. An attempt was made during the program to assess the reliability of the data collected by the sixth grade tutors. There were four checks made on each pair of tutors. Every endeavor was made to check each girl within the pair twice during the program. Due to an absence, however, one of the tutors was checked only once and another was assessed three times. Therefore, twenty reliability checks in all were taken.

The reliability checks were taken by the experimenter's assistants and in a few cases by the experimenter herself. The forms (See Appendix H) used for these checks were similar to the daily record forms. They differed in that they contained space for the tallies of the counters (the tutor who was keeping track of data collection), and also an area for the reliability checker to tally responses.

Behavior Modification Test. It has been mentioned before that the tutors were given four tests (See Appendix E) concerning general

behavior modification principles and particulars of their own tutee's program. Three of these tests were administered during the nine-day training period for the tutors, and the fourth test was given after the first two weeks of the actual tutoring program. These four tests were administered to nine of the tutors again on the last day of the program after the L2 period. The tenth girl completed these tests on the last day of the T2 period, twenty days before the other girls because she was moving out of the province before the end of the L2 period. These tests served as an indicator of the girls' actual knowledge of behavior modification techniques. They also would point out what effect the actual tutoring experience added to their understanding of the behavior modification techniques taught during their training period.

As an added measure, the sixth grade tutors (with the exception of the girl who moved before the L2 period) were asked to write down in their own words what they had liked best about this program and/or three things that they had learned during the program. This anecdotal type of data was utilized to give a subjective view of what aspects of this type of tutoring program appealed to children of this grade level.

Parental Questionnaire. A third additional measure was in the form of a questionnaire (See Appendix I) to the parents of the tutees. This questionnaire was completed by two of the parents during an explanatory meeting two weeks after the termination of the program, and by the other three parents during the summer following the program. This questionnaire was aimed at obtaining the parent's general

view of the program, and to determine if any of the target behaviors had generalized to the home situation.

Planning of the Tutee's Program

It was evident from the diversity of handicaps, personalities, and general intelligence level among the tutees that it would be impossible to institute an identical tutoring program for each of the children. Similar programs would have greatly facilitated the making of comparisons and the generalizability of the obtained results. The experimenter, however, felt that a major advantage in the use of children as tutors was that with such an abundant source of manpower, individual programming for each child was placed in the realm of the possible. In typical classroom situations the teacher often finds herself teaching to the majority because she lacks time and sufficient help to carry out individualized programs. Every attempt was made in this study to individualize the tutoring. During the nine-day training period for the tutors they were instructed to keep their eyes open for skills that their tutees lacked, and to try to determine what snacks or treats their tutees liked especially. (The two groups of children had a common lunch hour since day two of the training program for the tutors.)

Since the program was basically to deal in self-help skills, a list of tentative target skills was arranged. This list consisted of skills used by Minge and Ball (1967) and Cameron and Crozier (1970). These skills included: (a) to pay attention, (b) to stand up on command, (c) to come when called, (d) to sit down on command,

(e) to remain seated, (f) to take off socks, (g) to take off sweater or shirt, (h) to take off pants, (i) to put on socks, (j) to put on sweater or shirt, (k) to put on pants, and (l) to wash (and dry) hands. These twelve skills were listed on a questionnaire (See Appendix J) sent to the tutee's parents prior to the institution of the program. The parents were asked to rate each skill by checking whether they felt that the particular skill was an important one for their child to learn, that they did not consider it important, that they had no opinion concerning the skill, or that their child already had the skill in question. The pre-program questionnaire also asked the parents if there were any other skills that they would want their child to work on in this tutoring program. They were also asked to note if there existed any physical handicaps that would interfere with the child's completion of any skill.

Since food preference is also of an individual nature, the parents were questioned as to what treats were especially reinforcing to their child. This was done by rating six standard treat items (i.e., Smarties, sugared breakfast cereals, ice cream, popsicles, cookies, and toast) on a scale of 1 to 6 (1 = most rewarding; 6 = least rewarding). In addition the parents could add any treats to the list that they felt were also rewarding to their child. In connection with this, it was also asked if the child had any allergies to certain types of foods.

Every attempt was made to include in the program behaviors that the parents felt were important for their children to learn. In two cases the homeroom teachers were asked what skills they would like

to see emphasized in two of the children. In the first case, the teacher was consulted because the mother (a foster-parent) was very general in her descriptions of desired behavior. Since the girl in question was reasonably adept at taking care of herself, very basic academic skills constituted her program. The second instance for which the teacher was consulted resulted from a situation in which the tutee, a boy, could usually carry out the self-help skills at school; but was unwilling to do them at home. He appeared to be behaving in this manner to gain the attention of his father whose occupation required him to be absent from home a great deal of the time. In this case (since this problem was not discovered until two to three days into the program), the three self-help skills were kept in the program for consistency's sake and to provide practice in these skills, since the boy was slow and inaccurate as a result of his cerebral palsy. Two basic academic skills were added to his program by his teacher, and it was these that the tutors emphasized.

In summary, for each of the five programs there was an average of five target behaviors (one tutee had 6 target skills on her program; another had only 4 skills on her program). There were twenty-five behaviors in all. However some of the behaviors had been counted more than once because they appeared in more than one of the tutee's programs. (There were 18 different target skills used over all of the tutees.) Of these 25 behaviors, 12 were selected from the 12 original self-help skills listed on the pre-program questionnaire to the parents, and checked by the parents as being important for their child to learn. Seven additional skills that were

not a part of this list were suggested by the parents of the tutees. The remaining six skills were suggested by the homeroom teachers, as explained above. Table 2 contains a detailed list of all behaviors used in the present study. After each program was finalized, the parents were sent a letter stating what behaviors were to be worked on by their child's tutors and what food reinforcement would be used with their child in the project (see Appendix K).

When the final programs were decided upon, each target skill within the program was broken down into substeps. This procedure followed the same guidelines as Breland (1965), Minge and Ball (1967), and Cameron and Crozier (1970). This method teaches the behavior backwards by teaching first the final steps in the behavior and building steps on to it until the initial step is learned. As more complex behaviors are learned, physical prompts and gestures are also faded out. The technique is basically the operant method of chaining in which response patterns become stimulus cues for another behavior (Reynolds, 1968). In theory it is, therefore, possible to elicit rather complex behaviors by the chaining together of very basic responses.

These behaviors were arranged in what was felt as an orderly and easy progression for the sixth grade tutors. Each behavior was named by the verbal command used in that particular skill. For example, the target skill of paying attention was termed "Look at me"; coming on command became "Come to me"; etc. Each behavior program was written as a set of instructions for the tutors to follow with each successive step numbered (1 = lowest, or easiest sub-step).

TABLE 2. SUMMARY OF TARGET SKILLS UTILIZED IN THE PROGRAMS OF THE FIVE TUTEES

Source	Description of Skills	No. Tutees Per Target Skill	Initial of Tutee(s)
Twelve original behaviors listed as part of the pre-program questionnaire.	1. putting on socks	1	G
	2. putting sweater on	3	G L C
	3. washing hands	1	G
	4. paying attention	3	D L C
	5. sitting on command	1	D
	6. standing up on command	1	D
	7. coming on command	1	C
	8. taking sweater off	1	C
	Sub-total:	12	
Behaviors added by parents of the tutees.	1. unbuttoning	2	D L
	2. buttoning	2	D L
	3. speaking out loud	1	L
	4. naming objects from pictures	1	C
	5. answering "yes"	1	C
	Sub-total:	7	
Behaviors added by homeroom teachers of the tutees.	1. telling time (hours)	2	G J
	2. recognizing nos. 1-10	1	G
	3. recognizing capital letters	1	J
	4. recognizing small letters	1	J
	5. recognizing nos. 1-20	1	J
	Sub-total:	6	
	TOTAL:	25	

This facilitated the actual following of the program; and, also made easier the achievement of the criterion established for proceeding to the next step in the target behavior. An example of the form used in a target skill follows:

LOOK AT ME

Standing or sitting in front of child:

1. gently turn the child's head in your direction and say, "Look at me, _____."
2. lightly touching the child's chin, make turning motion and say, "Look at me."
3. make turning motion and say, "Look at me."
4. say "Look at me."

Standing at least 5 feet away from child:

5. making turning motion and say, "Look at me."
6. say "Look at me."

(Appendices L through P contain the entire program of each of the five tutees.)

As a final measure to individualize the programs of the tutees, a booklet was prepared for each tutee's parents explaining the purposes, techniques, and results of the program. This booklet was presented to three of the parents at an explanatory meeting held two weeks after the termination of the project. The other two parents were unable to attend and their booklets were sent to them through the mail. Each portfolio contained general information concerning the program. However, each portfolio also contained the individual

program of the particular tutee in question, and graphs showing (a) the number of correct and incorrect responses per tutoring session; (b) the percentage of correct responses per tutoring session; (c) the cumulative number of correct and incorrect responses per tutoring session; and (d) the number of "learned skills" per progress report. (See Appendix Q for the contents of this booklet in detail.)

This individual information was explained in the portfolio and in person by the experimenter to the parents who attended the explanatory meeting. To this meeting were invited the tutee's parents, the principals of both schools, the homeroom teachers of both the sixth graders and the retarded children, the parents of the tutors, and the tutors themselves. Of those invited three parents of the tutees, three tutors, two parents of the tutors, and the principal of the school for the retarded children were in attendance. Besides the general information that was presented at the meeting, photographs and color slides were also shown to illustrate various aspects of the program.

CHAPTER III

RESULTS: DAILY OBSERVATION RECORDS

Introduction

Since the experimental design in this study was a single subject one, the results for each tutee are discussed separately in the form of a case study. The format of each case study is identical in that each contains (a) an anecdotal description of the tutee, (b) a delineation of the program designed for the particular child, (c) the materials used during tutoring, (d) the presentation and discussion of results obtained from daily observation records, and (e) a summary of relevant findings.

The presentation of the data contained in the observation records is presented graphically. A brief description of each graphical representation and the order in which they are presented in each case study follows:

1. Number of Correct and Incorrect Responses Per Tutoring Session. This graph presents data on the frequency of correct and incorrect responses per tutoring session.
2. Percentage of Correct Responses Per Tutoring Session. This graph presents the percentages of correct responses per tutoring session.
3. Cumulative Number of Correct and Incorrect Responses Per Tutoring Session. This graph contains the rate of correct

and incorrect responses over the major experimental phases.

4. Weighted Percentages Correct Per Week of the Program. On these graphs each of the target skills in a tutee's program was plotted separately per week by weighting the number correct and incorrect responses by substep number. The determination of the weighted percentages of correct responses not only accounts for the actual number of correct and incorrect responses, but also the level (substep) at which the response occurred (See Procedure, p. 29).
5. Progress Tests. This graph contains the results of the progress test that were administered before the start of the program and after the termination of each major experimental phase. These results consisted of requesting the tutee to perform the final or goal behavior for every target skill in their program, receiving only social reinforcement upon its successful completion (See Procedure, p. 29).

Case Study 1: D.

Description. D. was 9 yrs. 8 mos. old at the beginning of the program, weighed 50 lbs. and stood 3 ft. 9 in. tall. His eyesight was poor; and, consequently, he wore glasses. D. had been diagnosed as having Down's Syndrome or mongolism, and physically his appearance was typical of that of a mongoloid child (Heber, 1961, 37-38). D. seemed small for his age, although he was somewhat on the chubby side. His gross motor activities seemed fairly developed, but still not reaching the level of the average nine-year-old (Espenchade &

Eckert, 1967). Playing "rough" (e.g., running, sliding on the floor, being swung by his tutors, etc.) was extremely enjoyable to him. The range of movement in his limbs was greater than normal; and, similarly, there was evidence of muscle hypotonicity.

D., however, was not as advanced in more refined motor activities. Although he was able to manipulate his lunch accurately and neatly, he had a great deal of difficulty in accomplishing tasks; such as lacing shoes, buttoning and unbuttoning. This inability at fine tasks was accentuated by D.'s impatience at tasks requiring concentration. Although it seemed that D. was able to unbutton his coat, his usual response was to yank at the two sides of the coat until it came undone, usually losing a few buttons in the process.

Language development was at an especially low level in D. It was obvious that he had a fair receptive vocablulary, for he could usually follow simple directions and commands. However, it often took numerous repetitions for D. to finally pay attention to any particular command. He also seemed fairly able to discern feelings of anger or pleasure in other individuals.

D.'s expressive language was practically non-existent. Although he did vocalize spontaneously, it was always in the form of squeals, laughs, cries, and unintelligible sounds. D., however, did emit some imitative speech during his tutoring sessions. He would often yell the command his tutors had just given as he performed the desired behavior. During the course of the program no descriptive speech (the naming of objects, people, etc.) was observed in D.; nor did he use speech in any sort of meaningful way. However from report

cards, it appeared that D. could identify some pictures with one word; and, also, use single words in a communicative situation. These verbal behaviors, however, were not observed during the turoring program. When D. did imitate speech it was characteristic of delayed speech problems (described in Van Riper, 1963), being immature and characteristic of many mentally retarded children.

Emotionally D. appeared very unstable. He was extremely easy to frustrate. In fact, on a few occasions tutoring had to be suspended because D. had come to the session upset for reasons that were unknown to the experimenter. D. was also very hyperactive and it was often very difficult to make him sit down for any length of time (except for lunch -- food was extremely reinforcing to him).

D. seemed to shun any sort of social interaction with his peers. He would actively push away one of the other tutees (C.) whenever she made any playful advances toward him. It appeared that D. preferred solitary play activities to group activities. He would often amuse himself by walking around in a small circle, humming to himself. Whenever anyone would join in this game by following him, he would cease playing or actually run away from the situation. D. seemed to enjoy teasing and would often run away to climb on the furniture or to flick the light switches in the gymnasium. Despite all this asocial behavior, D. seemed to enjoy being held and tossed about by his tutors, which eventually helped establish a favorable rapport between them. It is interesting to note that most of D.'s objectionable behavior occurred before the start of the tutoring session and afterwards during the lunch break. During the tutoring

periods (especially when food reinforcements were instituted), D. was very cooperative and usually quite attentive.

In the area of adaptive behavior, D. was fairly accomplished and able to care for himself with supervision. He was toilet-trained and was reported to have had only an occasional accident. In feeding himself, D. usually ate his food in order (sandwich through to dessert). D. also seemed able to dress himself, only having difficulty with tasks requiring fine motor dexterity.

No intellectual assessment was available for D. However, it was assumed that he fell within the trainable classification as described by Heber (1961) in the Adaptive Behavior Classification System:

> Level II, age: 6-12. Can talk or learn to communicate; can be trained in elemental health habits; cannot learn functional academic skills; profits from systematic habit training (p. 63) (Trainable).

It would seem that this description best describes D.'s general level of functioning. Coupled with a diagnosis of Down's Syndrome (which usually results in retardation of moderate to severe nature), it appeared that a classification of trainable would accurately describe D.

Program. In view of D.'s general behavior and after consulting the pre-program questionnaire answered by his parents, it was decided that D.'s program should concentrate on increasing his ability to follow instructions and on the acquisition of some fine motor skills. Therefore, the target skills that were selected for D. consisted of: (a) paying attention, ("Look at me."); (b) standing on command,

("Stand up."); (c) sitting on command, ("Sit down."); (d) unbuttoning, ("Unbutton your shirt."); (e) buttoning, ("Button your shirt."). (See Appendix L for D.'s entire program in detail.)

Materials. The apparatus and equipment used in D.'s tutoring program consisted of:

1. Smarties -- small candies used as the primary reinforcement for correct responses.
2. Tissue paper -- standard equipment in all tutoring booths, used for spills, wiping hands, etc.
3. Apron with pocket -- worn by the tutor to keep the reinforcements under the control of the tutor at all times, since D. had a habit of appropriating all food that was unattended. When D. became easier to control, this apron was discarded in favor of a tin because of D.'s tendency to look toward the pocket where the Smarties were kept instead of toward the face of his tutor.
4. Shirt -- used in the buttoning and unbuttoning activities. The first shirt was a pyjama top donated by D.'s mother, but the buttons proved to be too small for his manipulation. This was substituted by another pyjama top with larger buttons, which were more suitable for the unbuttoning exercises. However, for the buttoning activities another garment (a vest owned by the experimenter) was substituted with even larger buttons (bulky, wooden type) and larger buttonholes.

Number of Correct and Incorrect Responses Per Tutoring Session for Tutee D. (Figure 1). D.'s tutors in the beginning of the program had much difficulty keeping the time lag between D.'s response and the subsequent reinforcement short. They also had a tendency to waste time between stimuli (commands) presentations. The result was a very slow-moving tutoring session with D. losing interest and requiring disciplinary measures for his subsequent disruptive behavior. The first problem was remedied by demonstrating correct reinforcement procedures to the two tutors during an actual tutoring session. Beginning with session 10 in T1, D.'s tutors were given an extra point toward their token system for each of the tutoring sessions when 20 or more responses (correct or incorrect) were recorded. This extra point was removed after the L1 period, but the number of responses per tutoring session usually remained above the 20 mark. This higher number of responses per session kept down the frequency of disruptive behaviors during the session; and, for the most part, insured that D. would remain attentive during the 15-20 minute tutoring sessions.

According to Figure 1, the number of correct responses generally increased while the number of incorrect responses remained approximately equal. During the B1 period the number of correct responses essentially equaled the number of incorrect responses. In the T1 period (before Easter break), although the frequency of correct and incorrect was still very close, more variation was noted. A greater number of correct responses and a corresponding increase in the number of incorrect responses was observed almost simultaneously

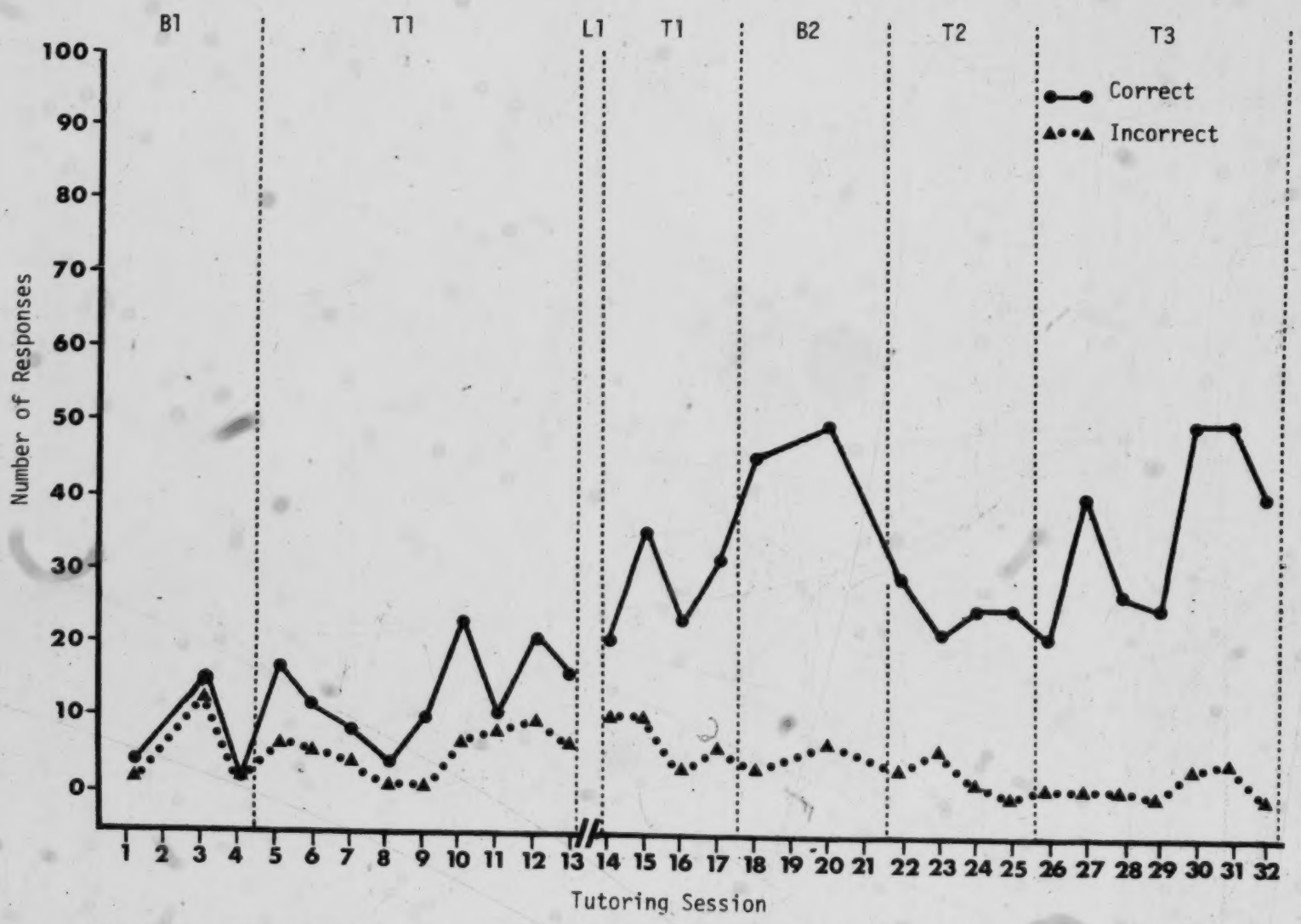

FIGURE 1. NUMBER OF CORRECT AND INCORRECT RESPONSES PER TUTORING SESSION. (TUTEE D.)

with the previously mentioned reinforcement (beginning with session 10) of the tutors for accomplishing more during the tutoring sessions. It did not appear to represent a true improvement period, because the percentages of correct responses were very similar to the B1 phase (See Figure 2).

The L1 period did not decrease the number of correct responses; for there seemed to be a steady increase in the number of correct responses while the number of incorrect responses plateaued at a relatively low level after Easter break.

When both primary reinforcement (food) and secondary reinforcement (praise) were removed during the B2 period, D. did not show a decrease in the number of correct responses, as would have been expected; but rather an increase of correct responses. However, during this period there were only two days on which data were collected because D. was upset on one of the days and his tutors were absent on the other.

The initial increase in the frequency of correct responses during the B2 period appeared to be only a temporary extension of response patterns of the T1 period before the withholding of primary reinforcement became effective. However, during the T2 phase when social reinforcement was reinstated and primary reinforcement was withheld there did seem to be a corresponding decrease in the frequency of correct responses. This would seem to indicate that the social reinforcement had little control over D.'s behavior, and it was the primary reinforcement that served as the controlling factor.

Further indication that the utilization of behavior modification

techniques was the controlling factor in D.'s change of behavior was the return of some disruptive activities during the B2 and T2 phases. Although the evidence was anecdotal, it did appear significant in that it revealed characteristic behavior patterns of frustration observed during extinction periods in comparative operant research (Kimble, 1961). During these two phases D.'s inappropriate and maladaptive behaviors increased. It became increasingly difficult to keep him in his seat during the tutoring session, whereas, when food reinforcement was used, he was usually very quiet and attentive. He continued misbehaving during the lunch period by grabbing at the lunches of others; and, consequently, he often had to be returned to his classroom early. This disruptive behavior terminated when food reinforcers were reinstated during the T3 phase.

It is also significant to note that when primary reinforcers were reinstated into the program for the T3 period, D.'s correct responses returned to a higher level. Although there was some fluctuation, a pattern of general improvement during this phase was noted, with incorrect responses leveling off at near zero with the exception of the last few days of the T3 period.

In summary, Figure 1 indicates that, in general, the program was successful in increasing the number of correct responses per tutoring sessions and in keeping the number of incorrect responses at a very low level. There is also some indication that the behavior modification techniques used were instrumental in controlling the behavior of D., as was evidenced by a decrease in the number of correct responses during the T2 phase, and the return of some of

D.'s disruptive behaviors during the tutoring sessions when food reinforcement was withheld.

Percentage of Correct Responses Per Tutoring Session for Tutee D. Although there are many fluctuations in the percentages of correct responses as depicted in Figure 2, a general trend of improvement is indicated on this graph. When the T1 (food and social reinforcement) phase was initiated, there was a steady increase in comparison to the B1 period in the percentage correct responses until the point when D.'s tutors were reinforced for accomplishing more during the tutoring session. The percentages correct during this time (sessions 10-13) were very similar to the B1 percentages, with the exception of being just slightly higher. After the L1 period there was no decrease in the percentage of correct responses; in fact, a steady increase was noted during this time, indicating that the latency period did not noticeably affect the percentages of correct responses.

When, however, primary (food) and secondary (praise) reinforcement were withheld during the B2 period, there appeared to be a leveling off of the percentages of correct responses which continued during the T2 period when only social reinforcement was given for correct responses. The percentages during the periods (B2 and T2) were for the most part quite high (around 90%) with the exception of one day (79%). During the T2 period the number of stimuli (commands) presentations was lower (See Figure 1), and could account for the higher percentages of correct responses. This pattern of leveling off at higher percentages continued into the T3 period when both

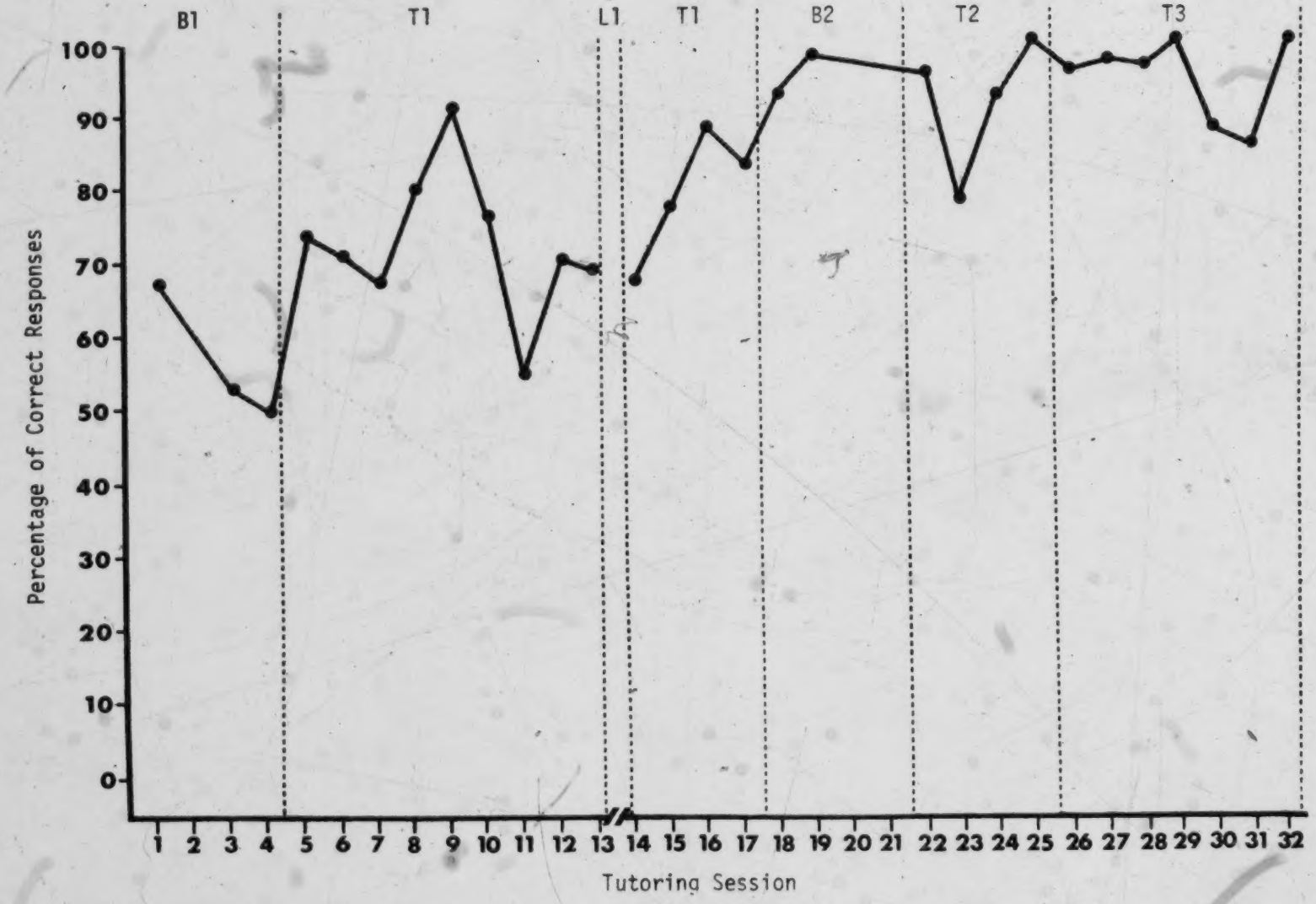

FIGURE 2. PERCENTAGE OF CORRECT RESPONSES PER TUTORING SESSION. (TUTEE D.)

types of reinforcement were reinstated into the program indicating that D. had reached a ceiling of performance.

Some evidence seemed to exist in Figure 2 that the behavior modification techniques used in this program had a beneficial effect on the control of D.'s behavior. In addition, the general trend of improved percentages of correct responses seemed to indicate that the program was beneficial in some way to D.; but on this graph it is difficult to definitely attribute the change in behavior to the use of behavior modification techniques.

Cumulative Number of Correct and Incorrect Responses Per Tutoring Session for Tutee D. Figure 3 presents a general picture of improvement for Tutee D. There did appear to be a significant difference between correct and incorrect responses indicated on Figure 3 by the increase in the slope of the line representing the cumulative number of correct responses and the decrease in the slope of line representing the cumulative number of incorrect responses.

During the B1 period the two lines are essentially equal, indicating that the rate of correct responding was approximately equal to the rate of incorrect responding. When the T1 phase was instituted, the rate of correct responding also increased. However, it did not appear to be appreciably different from the slightly decreasing slope of the cumulative number of incorrect responses. It was after the L1 period during the remainder of the T1 phase that the rate of incorrect responding began to depart significantly from the rate of incorrect responding. The rate of correct responding continued to increase throughout the T1 period and into the B2

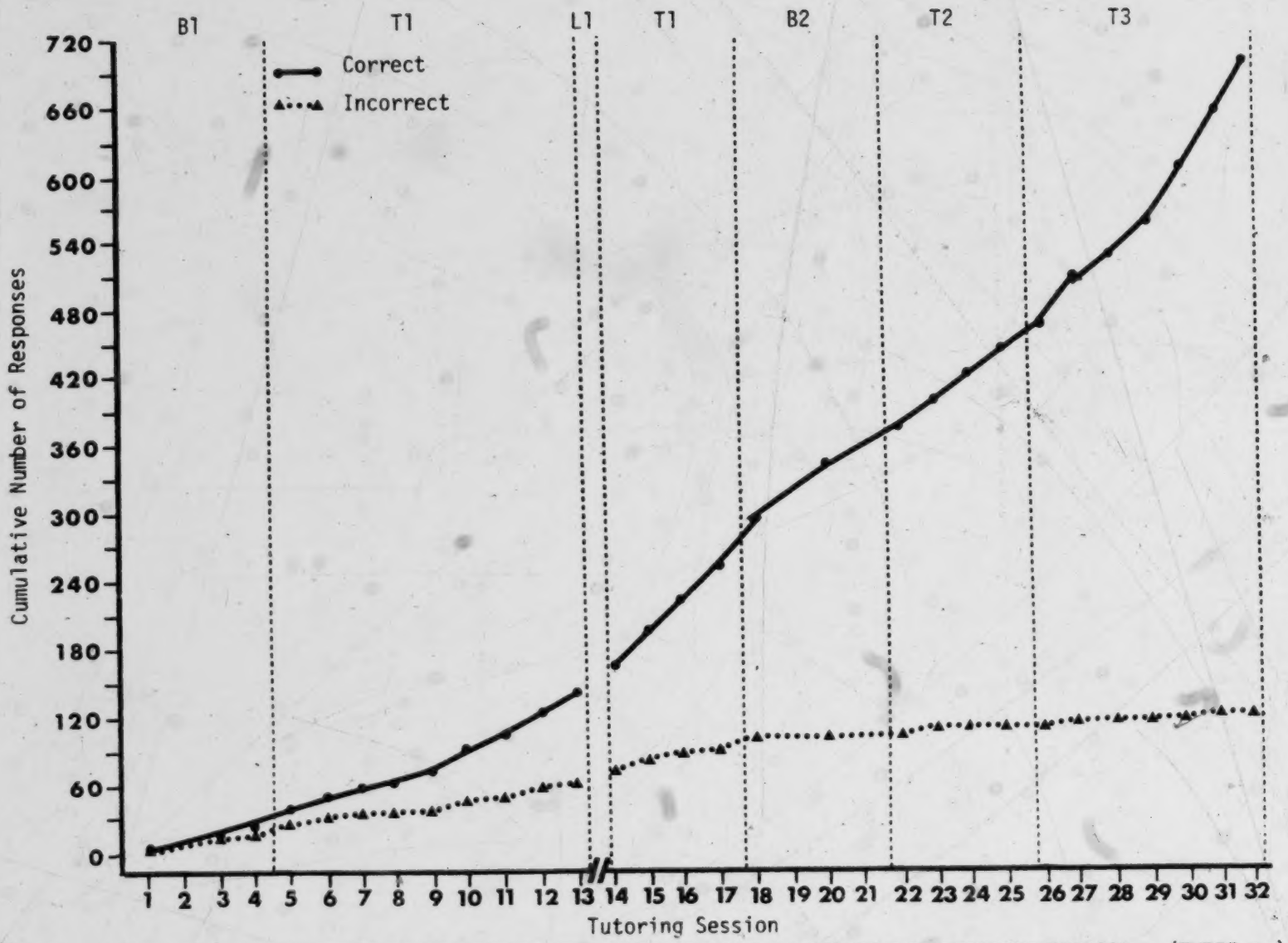

FIGURE 3. CUMULATIVE NUMBER OF CORRECT AND INCORRECT RESPONSES PER TUTORING SESSION. (TUTEE D.)

period. However, the increase in rate of correct responses during the B2 phase could have been an artificial increase, since there were only two days of data collection during this period. The rate of incorrect responding during these two periods was very low as indicated by the slope (approaching zero) of the line representing cumulative number of incorrect responses.

During the initial part of the T2 period there seemed to be a decrease in the slope of the line representing correct responses, perhaps the result of no tutoring sessions during the four days preceding the initiation of the T2 period. After this initial lag the rate of correct responding continued to increase although there were more fluctuations during the T3 period. During the T2 and T3 phases the rate of the incorrect responses continued to approach the near-zero level.

In summary, Figure 3 lends credibility to the hypothesis that D. did improve during the tutoring program as was evidenced by the constant increase in the rate of correct responding, and the subsequent decrease in the rate of incorrect responding. However, there appeared to be little evidence in Figure 3 that the behavior modification techniques employed by this program were responsible for the change in D.'s behavior. When reinforcement (both primary and secondary) are withheld, during the B2 phase, there did not seem to be any decrement in the rate of correct responding or increment in the rate of incorrect responding. The evidence presented on this graph concerning the effectiveness of the behavior modification techniques used as a tutoring method in this study seems inconclusive.

Weighted Percentages of Correct Responses Per Week[2] of the Program for Tutee D. Up to this time all the data have been presented graphically across all behaviors. It would seem useful to determine progress or lack of progress through each target skill incorporated into a tutee's program. (See Appendix L for a detailed description of the target skills for Tutee D.)

The weighted percentages correct for each target skill encorporated into D.'s program follows. (Appendix R contains the tables used in the computing of the weighted percentages correct per week for all of the tutees.)

1. "Look at me." Figure 4 presents the weighted percentages of correct responses for the target skill, "Look at me." There were six substeps comprising this target behavior. There was a general trend of improvement on this skill, with D. obtaining a 100% on the weighted percentages for the last four weeks of data collection of the program. At the end of 3 1/2 weeks, there was a decrease in the weighted percentages correct, but it was still higher than the initial percentage after the B1 period. In looking at Table R-1 (Appendix R), it appeared that D. had reached the highest substep (6) in this target skill, since all of the correct responses were at this level at the termination of the program.

2. "Stand up." Figure 5 also indicates that D. had improved

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[2]The data for week 3 and half of week 4 were combined and graphed under week 3 1/2. No weighted percentages were computed for weeks 4, 5, 11, and 12 because no data were collected during the L1 and L2 phases.

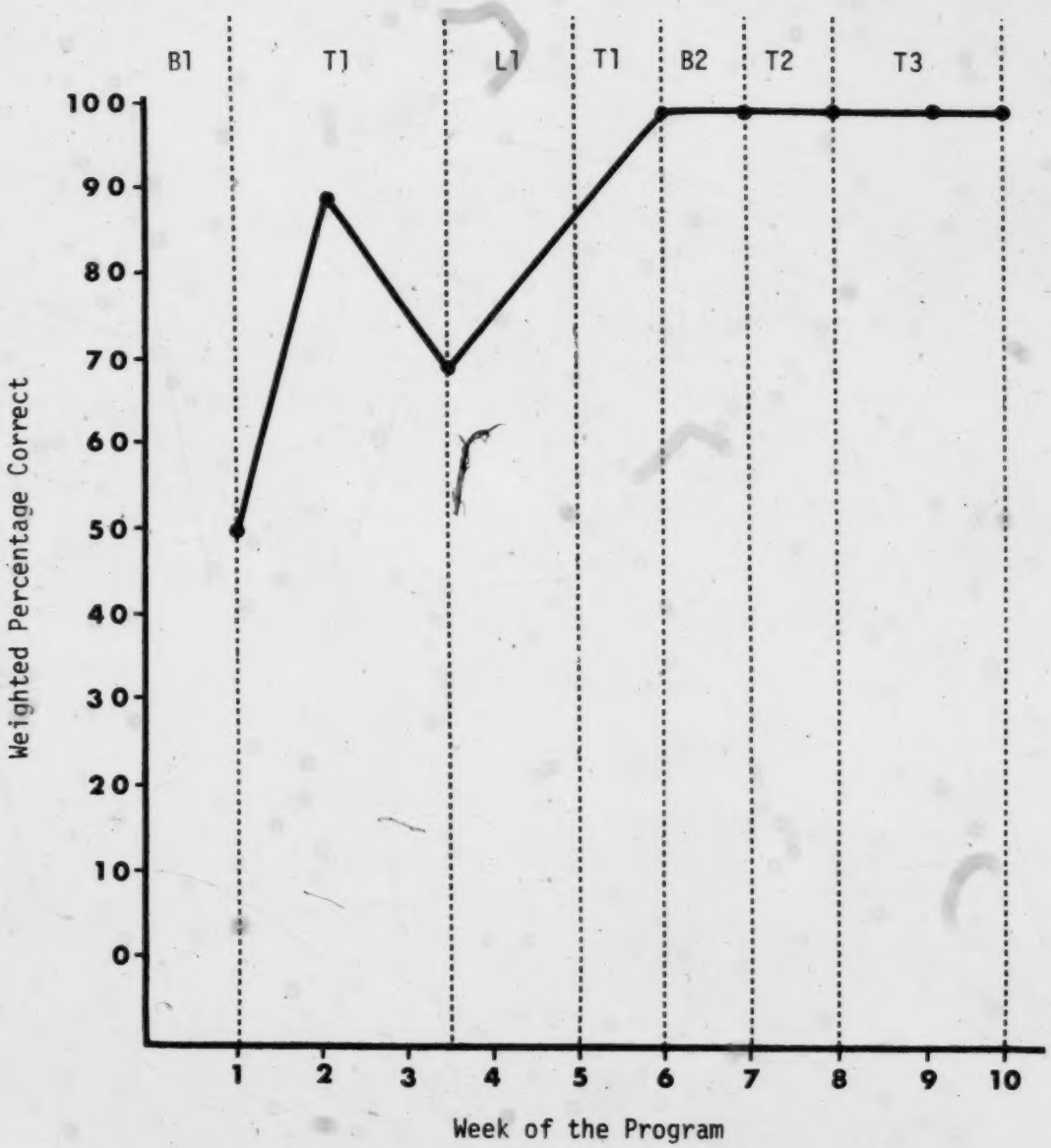

FIGURE 4. WEIGHTED PERCENTAGES CORRECT. TARGET SKILL "LOOK AT ME." (TUTEE D.)

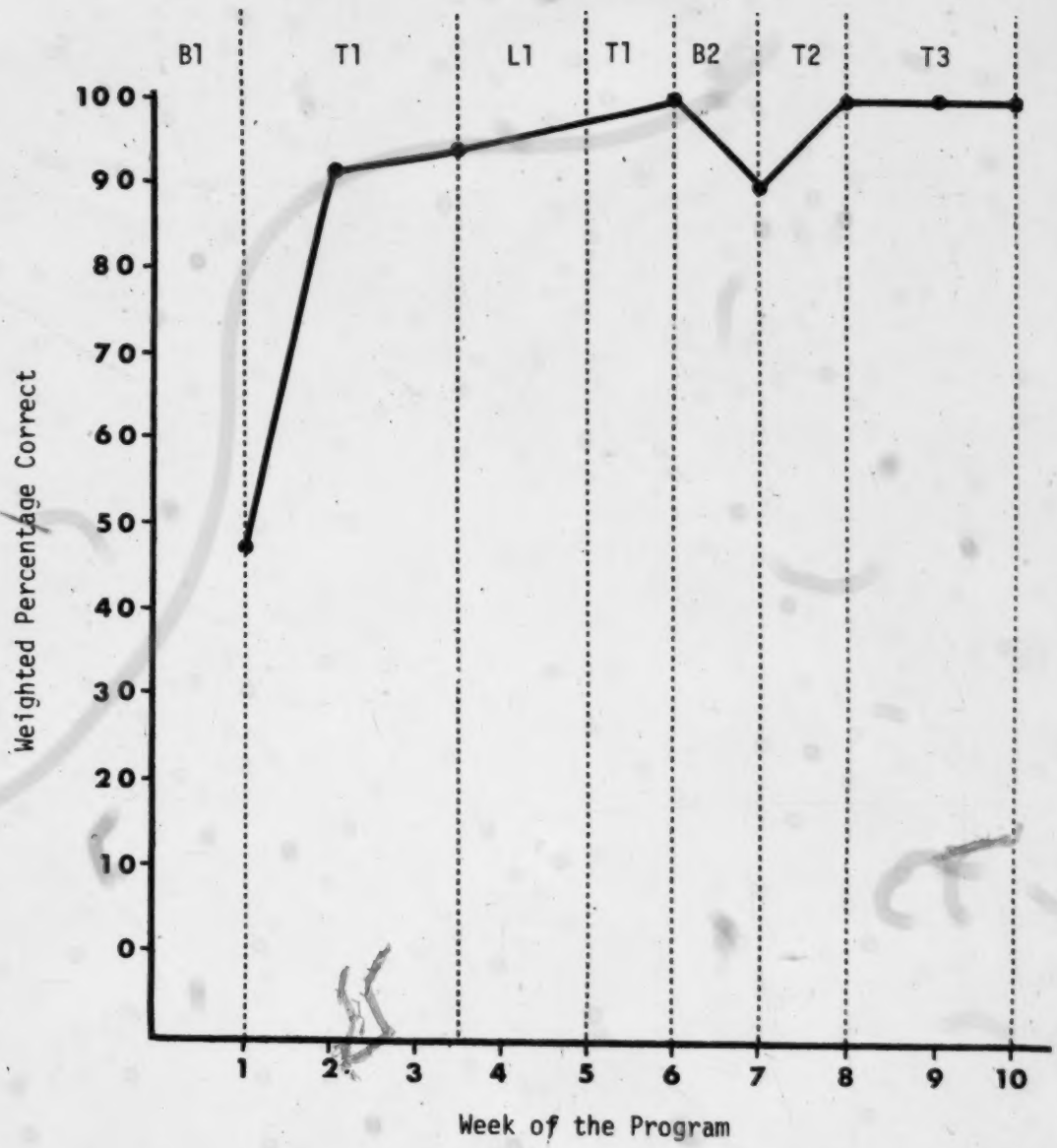

FIGURE 5. WEIGHTED PERCENTAGES CORRECT. TARGET SKILL "STAND UP." (TUTEE D.)

on the target skill "Stand up." There was a large increase in the weighted percentage correct during the T1 period. This level reached 100% at the end of the T1 period and continued to remain at the 100% level, except for a drop at the end of the B2 period. This decrement could have been due to the withdrawal of all reinforcement during the B2 phase. Referring to Table R-2 (Appendix R), D. seemed to have also reached the highest substep (6) in this target skill.

3. "Sit down." Figure 6, target skill "Sit down." indicates that D. already had this skill in his behavioral repertoire. This was probably due to his repeated exposure to this command in classroom and other school situations. The high weighted percentage correct after the B1 period was probably not particularly meaningful, since only 6 stimuli presentations (compared to 210 during week 10 of the program) were given during week 1. Again there was a slight decrement in the weighted percentage correct after the B2 period. Thereafter, D. regained the highest substep (6) in the target skill. In fact, he was always tutored at this level during the program. Although at a high initial level for this target skill, it was obvious from Table R-3 (Appendix R) that the reliability of D.'s responding correctly to this command was increased significantly throughout the program.

4. "Unbutton your shirt." There are more fluctuations apparent on Figure 7 for target skill unbuttoning. This was probably due to the relative difficulty of this task and the problem D. had in maintaining concentrative effort on fine motor tasks. It had been

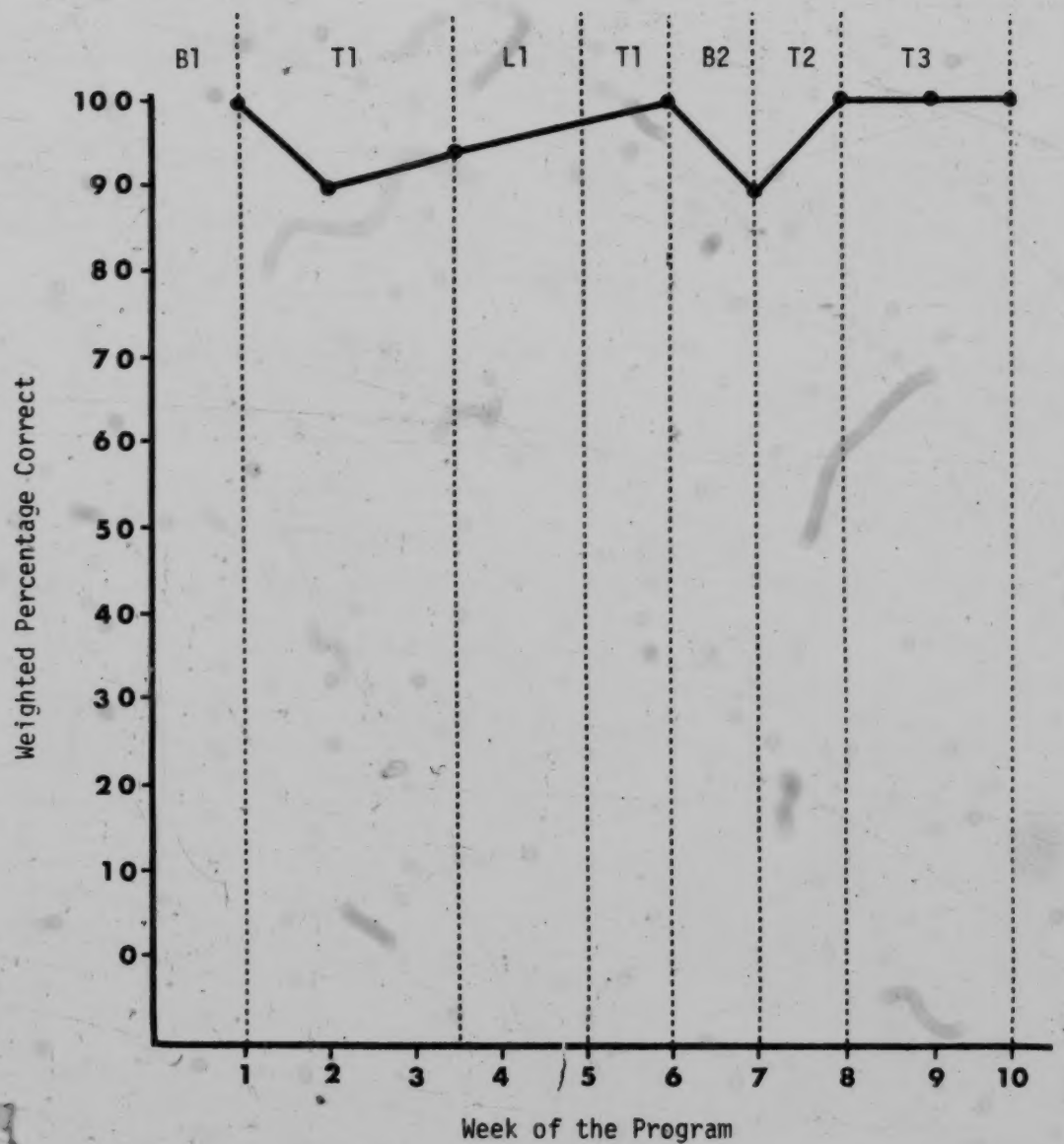

FIGURE 6. WEIGHTED PERCENTAGES CORRECT. TARGET SKILL "SIT DOWN." (TUTEE D.)

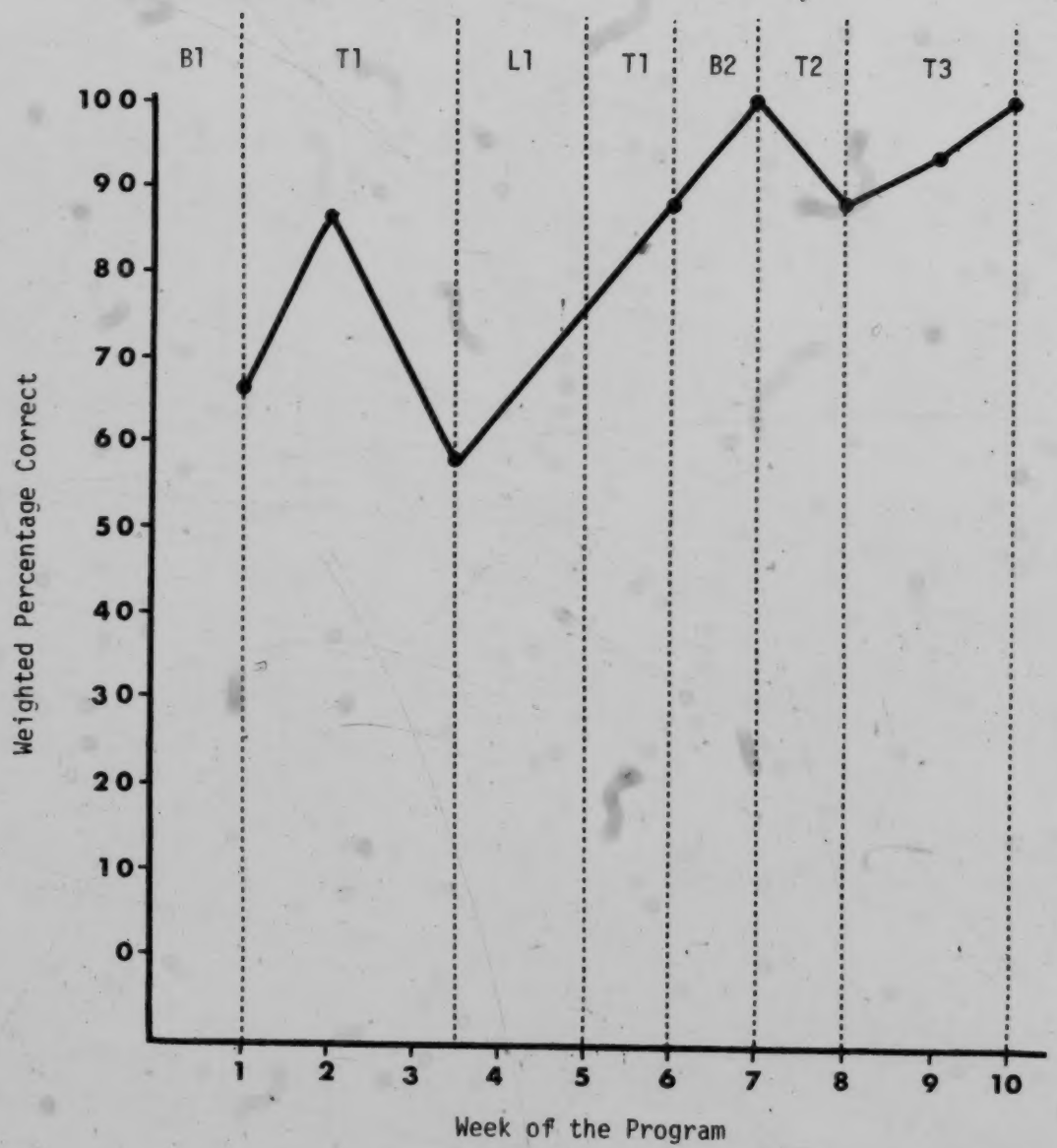

FIGURE 7. WEIGHTED PERCENTAGES CORRECT. TARGET SKILL "UNBUTTON YOUR SHIRT." (TUTEE D.)

mentioned before that D. knew how to unbutton, but he performed the task unreliably, usually resorting to merely tearing his garment open. During the B1 period only substep 1 was emphasized by the tutors, but beginning the second week, substep 6 (second highest substep) was worked on exclusively by the tutors (Table R-4, Appendix R). Although there were fluctuations in the weighted percentages for this target skill, the trend was one of improvement. For example, during week 10 of the program, D. responded correctly to 180 stimuli presentations out of 180.

5. "Button your shirt." The target skill, "Button your shirt" was probably the only task in which D. did not have any basic competence before the program. Similarly, the improvement in the weighted percentages on buttoning seemed to be the most pronounced. Reference to Table R-5 (Appendix R), shows that the pattern of responses throughout most of the program were stationary at substep 1, out of a possible seven substeps. As the program continued, the number of incorrect responses declined with more and more attempts at tutoring being made at higher substeps. The maximum substep reached was 3 during week 7. During week 10, D. achieved a substep of 2 with a fair percentage of correct responses. This target skill appeared to be the most difficult for D., probably because of the fine motor complexity of the task and the necessity for sustained attention. It was also a problem to find suitable pieces of clothing for such as task. Most clothing for small children seems to have very small buttons and buttonholes. A vest owned by the experimenter was used because of its bulky buttons and larger buttonholes.

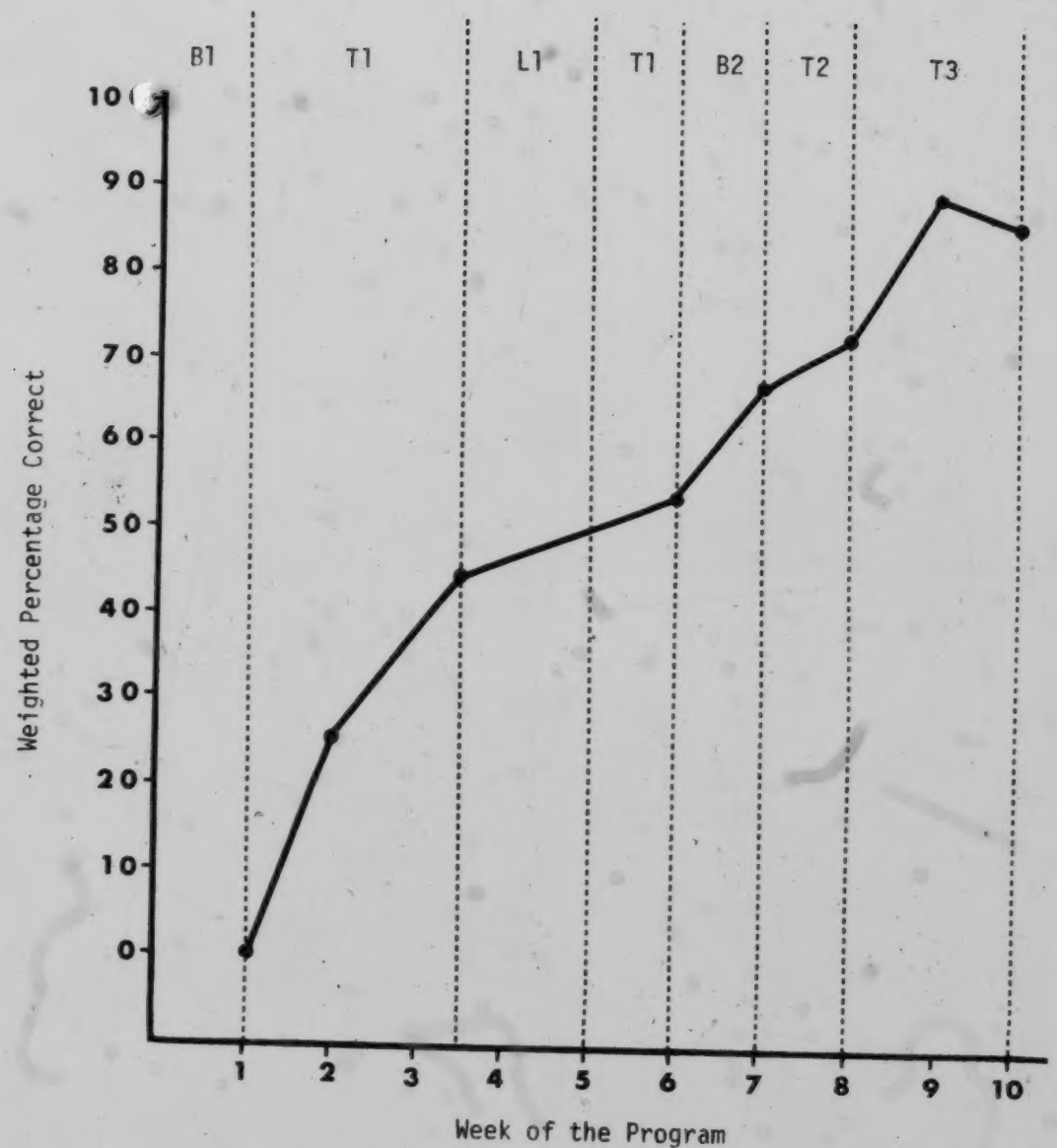

FIGURE 8. WEIGHTED PERCENTAGES CORRECT. TARGET SKILL "BUTTON YOUR SHIRT." (TUTEE D.)

One can only speculate if the tutoring in the present study would generalize to D.'s own clothing.

In summary, it appeared that there was improvement in all of the target skills in D.'s program. Prior to the tutoring sessions, most of the target behaviors with the exception of buttoning were already in D.'s behavioral repertoire, but were elicited on an unreliable basis. Skills such as sitting on command and standing on command already were present at a high level but the reliability of their appearance seemed to be raised considerably by the program.

The only two skills that showed a temporary decrease after the B2 phase were sitting and standing on command. Of all the target skills, these were the two with which D. was the most competent before the institution of the program. It would appear that for D. well-known responses were more under the control of the reinforcement, while newly-learned responses seemed to be motivated by other contingencies. Perhaps the novelty of the new tasks was motivating in itself while the old tasks had become disinteresting to D.' and, consequently, he needed the reinforcement to maintain motivation.

Progress Tests for Tutee D. Figure 9 is a graph of the number of learned skills (2 out of 3 scored as "+") for each progress test administered during the duration of the program. When the program was initiated D. performed 3 of the 5 target skills up to the specified criteria. During the T1 period before Easter break he had learned 4 out of the 5 skills but it was after Easter that D. obtained his peak performance with all 5 target behaviors being classified as learned skills. During the B2 period there was a subsequent

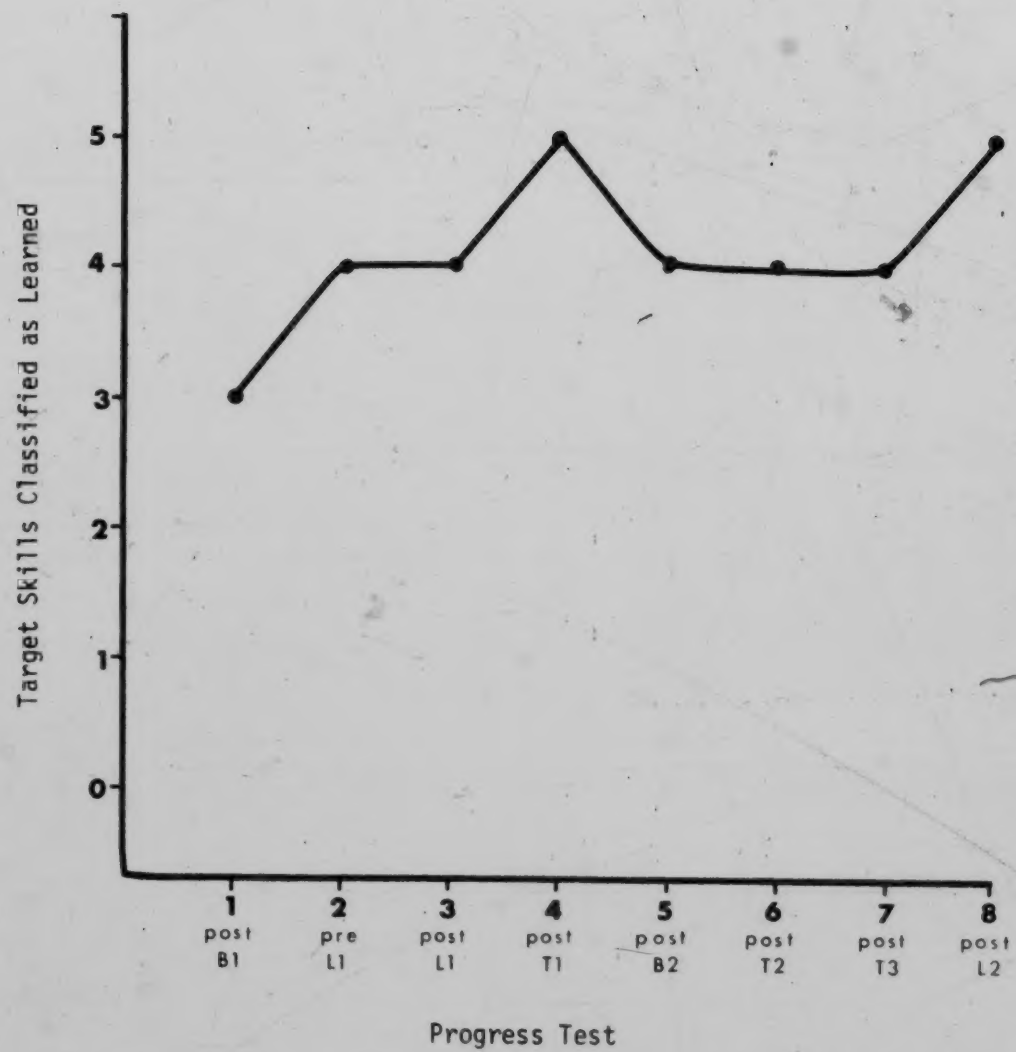

FIGURE 9. RESULTS OF PROGRESS TESTS. (TUTEE D.)

decrease in the number of target skills classified as learned. The lower level was maintained throughout the T2 period. It would appear that the withholding of reinforcement did have some effect on D.'s performance. However, D.'s performance did not return to its previous T1 level when both types of reinforcement were reinstated into the program (T3 period). It appeared from the data, therefore, that the reinforcement was no longer effective.

Summary of Results for Tutee D. As was indicated on all the various graphs in which the data were presented for Tutee D., there appeared to be a general trend of improvement over the duration of the project. The number of correct responses showed an increasing tendency throughout the program (except during the no-reinforcement period), while a low number of incorrect responses was maintained (Figure 1). For the most part, the number of correct responses remained greater during the treatment periods in which both social and food reinforcement were given for desired responses.

The percentage of correct responses (Figure 2) also increased over the initial baseline percentages during the tutoring program. There did appear to be a leveling off period followed by a one-day decrease in the percentage of correct responses during the B2 and T2 periods. This was followed by a slightly higher plateau of percentages correct during the T3 period. It would appear from this graph that substantial gains were made by D. during the tutoring program, but that perhaps D. had reached a ceiling of improvement in the target skills that were included in his program with the exception of buttoning.

The cumulative number of correct and incorrect responses (Figure 3) also indicated advancement throughout the tutoring program for D. The rate of correct responding continued to increase while the rate of incorrect responding approached the zero mark. There appeared to be a significant difference between the rate of correct responding and the rate of incorrect responding throughout the duration of the tutoring program.

All of the target behaviors included in D.'s individualized program showed improvement as depicted by the weighted percentages correct (Figures 4, 5, 6, 7, 8). Standing on command and sitting on command were already fairly established behavior patterns, so tutoring was limited to the highest substep level. The reliability of obtaining a correct response in these two target skills was greatly increased upon the termination of the tutoring sessions. Skills, such as paying attention and unbuttoning, although already a part of D.'s behavioral repertoire, did not initially exist at such high degree of competence as the sitting and standing tasks. However, the highest substep level was also attained for these skills by the termination of tutoring. Buttoning appeared to be a new task for D.; and, although it proved quite difficult because of the necessity for concentration some gains were evident by the end of the tutoring sessions.

The progress tests (Figure 9) for D. also indicated that some advancement was made with the various target skills. At the beginning of the program D. responded correctly 67% of the time to three of the five target behaviors. A maximum of five target skills was

considered "learned" after the T1 period. When both types of reinforcement were withdrawn there was a subsequent decrease in the number of skills learned, with only four being so classified. This high level was not regained during the T3 period, but returned after the L2 period.

It is apparent, then, that D. showed some progress while being involved in the tutoring project. However, what actually caused this progress could have been any number of factors or combinations thereof. Employing a single subject design in which subjects are used as their own controls, the role of the behavior modification techniques can be assessed. The results, however, were somewhat inconclusive in that control over D.'s behavior was indicated in some methods of recording the data and was absent in other methods of recording. In almost all of the cases (except in the weighted percentages of the target skill, sitting down) performance improved during the treatment periods, in comparison to the performance recorded during the B1 period. During the experimental phase in which primary reinforcement and secondary reinforcement (and/or during the phase where only primary reinforcement) was withheld, (a) the number of correct responses decreased, (b) the number of stimuli presentations decreased, (c) and the percentage of correct responses plateaued, followed by a decrease in percentage of correct responses on one day. Upon the reinstatement of both types of reinforcement the measures returned to, or increased over the measures obtained during the T1 period. All this would indicate support for the effectiveness of the behavior modification techniques.

However, on the other hand, there was no decrement in the rate of correct responding during the B2 and T2 periods as indicated in the cumulative number of correct and incorrect responses. The progress tests, although indicating a loss of one learned skill during the B2 and T2 phases, failed to indicate recovery when both types of reinforcement were reinstated. Likewise, only two of the target behaviors showed a decrease in their weighted percentages of correct responses during these two phases. Perhaps the no-reinforcement period was not long enough to extinguish the effects of the previous treatment periods.

There seemed, therefore, to be some contradictory evidence as to the effectiveness of the behavior modification techniques used as a tutoring device. However, D. did give various behavioral indications that he was, indeed, under the control of primary reinforcement. For example, he was quite hard to manage before food reinforcement was instituted into the program. When he was rewarded for correct responses during the treatment period, disruptive behavior decreased sharply. These inappropriate behaviors returned when primary reinforcement was withheld. They did not diminish when social reinforcement only was reinstated into the program. But, they did disappear again when primary rewards were again instituted into the T3 period. D.'s obvious interest in food (i.e., snatching at unattended food, licking food from the table, and his total engrossment in his lunch); plus his orientation to the apron pocket where the Smarties were kept seemed to indicate that primary reinforcement was in some way controlling D.'s behavior. Perhaps one

can postulate that the behavior modification techniques were effective in creating an environment (free from disruptive activities, etc.) that was conducive to learning and that D.'s progress through the target skills in the program was due to other motivational factors.

In summary, D.'s program seemed to have been beneficial in that there was progress through the various target skills selected as part of his tutoring program. Unfortunately, D.'s mother reported on the post-program questionnaire that she could determine no change in D.'s behavior at home. In some cases it appeared D. had reached a ceiling level and may have become disinterested in some of the tasks. There did appear to be evidence that behavior modification techniques provided a suitable atmosphere in which training was possible. However, the learning of specific skills could have been aided by the novelty of particular skills, the one-to-one ratio between tutor and tutee, and the actual systemization of the training approach as opposed to its content.

Case Study 2: C.

Description. At the beginning of the program C. was 9 yrs. 4 mos. old, stood 3 ft. 11 in. tall, and weighed 50 lbs. She appeared to be average in size for a nine year old. A 1964 diagnosis by the Alberta Guidance Clinic determined that C.'s dermal finger patterns were non-mongoloid. Her mental retardation was thought to have resulted from cranial anomalies of unknown etiology. These head irregularities were somewhat manifested in her physical appearance. The possibility of a mild hearing loss in C.'s right ear was also

mentioned in this report, but a hearing problem was not noticed during the tutoring sessions.

C.'s motor coordination was developmentally behind the average nine year old (Espenchade and Eckert, 1967). Her walking patterns resembled those of a much younger child, her gait being rather awkward, wide, and flat-footed. She had much difficulty negotiating stairs, usually requiring support to maintain her balance. There was also some evidence of hypotonicity. Although inadept at gross motor activities, C. enjoyed them very much. She would often watch D. playing with his tutors, laughing with enjoyment. Similarly, whenever her tutors engaged C. in any motor activities her delight was obvious.

C.'s fine motor coordination was also characteristic of younger children. For the most part, her grasp was immature; and any fine motor activities, such as buttoning and unbuttoning and lacing did not appear to be within her capabilities. C.'s report card indicated that she needed help in all craft activities, and that she easily lost interest in them. It appeared that C. had very little motor ability for tasks requiring concentrative and physical manipulatory skills.

There was some limited language development in C. She had a good receptive vocabulary, but would often not comply with simple directions because of inattention or what appeared to be mischievousness. Her expressive language, although at a low level, was evidenced by verbalizations, both spontaneous and upon request. She appeared able to imitate most sounds, although articulation was

usually inaccurate. C. knew her name, the names of some of her classmates, and the members of her family. She could also name a few objects when they were pointed out to her or when she was shown pictures. Occasionally, she would use a word to describe what she was doing, such as, "eat" for lunch time activities. Near the end of the project she surprised everyone by singing "Twinkle, Twinkle, Little Star." On the whole, C.'s language and speech was very immature and characteristic of delayed speech patterns (Van Riper, 1963). Her language behavior occurred sporadically and was often perseverative in nature. On some days little expressive language would be present, while on other days the opposite condition would exist. Very often she would repeat the same word throughout the session with little regard to what was asked of her, or to what she was looking. On these days C. appeared rather remote and not in contact with her immediate surroundings.

For the most part C. was very seldom upset and remained very pleasant and agreeable. However, there were times in which she appeared very distant with little association with her environment. Perseverative verbal activity would take place at this time; in addition to somewhat compulsive acts, such as, the placing and replacing of her apple on the same spot on the table for minutes at a time. These phases occurred on a very sporadic basis and usually would result in lowered performance.

C. seemed to enjoy associations with other individuals most of the time. However, her teacher remarked that C. often became over-excited and silly when playing with other children. She appeared

to be happy in her interactions with her tutors, and would actively seek out social reinforcement for correct responses by going first to one tutor to be hugged and then to the other. Her interactions with her tutors appeared to be marked by some teasing behavior. She would sometimes hesitate in performing a behavior (although smacking her lips in anticipation of her ice cream treat) with a mischievous little grin.

C. appeared fairly able to care for herself, except in the area of dressing. She was toilet-trained and could use the bathroom facilities adequately. She could manipulate her lunch pail and thermos with only a bit of difficulty. She was, however, slow to eat and usually needed much coaxing to finish her lunch. Her dressing skills were limited probably due to the physical coordination necessary in such tasks.

At the time C. was assessed at the Albert Guidance Clinic in 1964, she was placed by the Cattell Infant Intelligence Scale in the high trainable or low educable level of retardation. It would appear from C.'s adaptive behavior and language development that she probably was functioning at the trainable level.

Program. C.'s program consisted of six target skills emphasizing the following of directions and dressing. Included in these six skills were two verbal skills that were added after consulting the pre-program questionnaire filled out by C.'s parents. The target skills comprising C.'s program were (a) paying attention ("Look at me."), (b) coming on command ("Come to me."), (c) putting on sweater

("Put your sweater on."), (d) taking off a sweater ("Take your sweater off."), (e) naming objects from pictures ("What is this?"), and (f) answering "yes" ("Say yes."). (See Appendix M for C.'s entire program in detail.)

Materials. The apparatus and equipment used in C.'s tutoring program were:

1. Vanilla ice cream - used as primary reinforcement for correct behaviors.
2. Spoon and bowl - used for handling of ice cream.
3. Tissue paper - standard equipment.
4. Sweater - a pullover sweater belonging to C. used in teaching her to put on and take off her sweater.
5. Picture card - a 10 in. x 10 in. piece of green cardboard divided into quarter sections. In each square a colored picture, cut from a magazine, was mounted. The four pictures consisted of a tree, a dog, a cat, and a baby. This card was used in the naming exercises.

Number of Correct and Incorrect Responses Per Tutoring Session for Tutee C. Figure 10 presents a picture of the relative frequency of correct and incorrect responses for Tutee C. during the tutoring program. During the B1 period the number of correct responses appeared quite high while the number of incorrect responses was also relatively high. There was an immediate decrease in the number of incorrect responses at the beginning of the T1 phase with the number of incorrect responses generally remaining low throughout this period. Although the number of correct responses was more varied, it

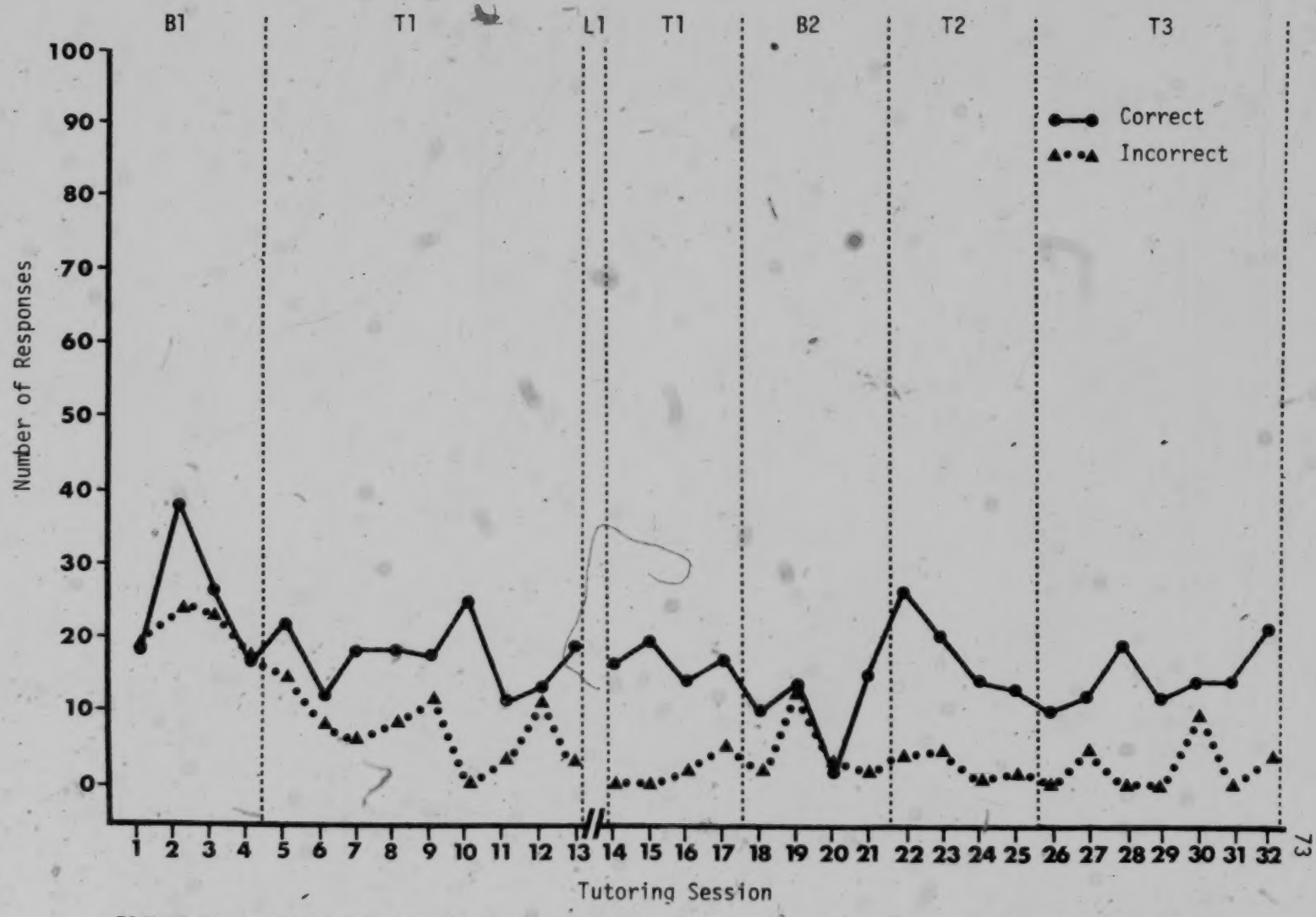

FIGURE 10. NUMBER OF CORRECT AND INCORRECT RESPONSES PER TUTORING SESSION. (TUTEE C.)

maintained a level above the number of incorrect responses. However during T1 phase, the number of correct responses was lower than that of the B1 period. This was probably due to the emphasis on very basic, simple skills during the B1 phase. The L1 phase also did not seem to have resulted in a lowering of the number of correct responses.

When both food and social reinforcement were withheld during the B2 phase, there was a general depression in the number of correct responses. However, the number of incorrect responses remained at a relatively stable low level. When social reinforcement was reinstated into the program (T2 phase), there was an immediate increase in the number of correct responses, indicating that social reinforcement was somewhat of a controlling factor in C.'s behavior. The high number of correct responses attained during the T2 phase continued into the T3 phase. Likewise, the number of incorrect responses generally remained low throughout these two periods.

C. also displayed some maladaptive behaviors during the B2 period. For instance, she appeared more aloof during this week. She also became extremely slow in eating and would often throw her food on the floor. These disruptive behaviors during the no-reinforcement period coupled with C.'s obvious anticipation of her ice cream reward and her active seeking out of social reward, appeared to indicate that she was in some way controlled by the reinforcements used during the tutoring program.

In summary, Figure 10 indicates that the number of correct responses generally was higher than the number of incorrect responses. The number of incorrect responses decreased steadily from a fairly

high level during the B1 period to a very low level during the remaining part of the tutoring program. There was also some indication on this figure that the behavior modification techniques employed as a tutoring device were effective in controlling C.'s behavior.

Percentage of Correct Responses Per Tutoring Session for Tutee C. Although there appeared to be many large fluctuations in the percentages correct, Figure 11 does present a general picture of improvement for Tutee C. The numerous fluctuations could be the result of C.'s differing moods as previously described.

During the T1 period there appeared to be a trend for C. to respond correctly more often than during the B1 phase. In fact, all the experimental phases were generally above the B1 phase in terms of percentage correct with the exception of the B2 period. During this phase when both types of reinforcement were withheld, there was a large decrease in percentage correct on two of the days during this period. Likewise, during the T2 phase when social rewards were reinstated the percentage of correct responses again returned to a high level. These changes give evidence as to the effectiveness of the behavior modification techniques employed as a tutoring device throughout C.'s program.

It appeared, therefore, that C. did benefit from the tutoring program as indicated by an increase of the percentages of correct responses. The behavior modification methods (especially social reinforcements) seemed to have aided in C.'s progress in that more improvement was noted during periods in which these techniques were applied.

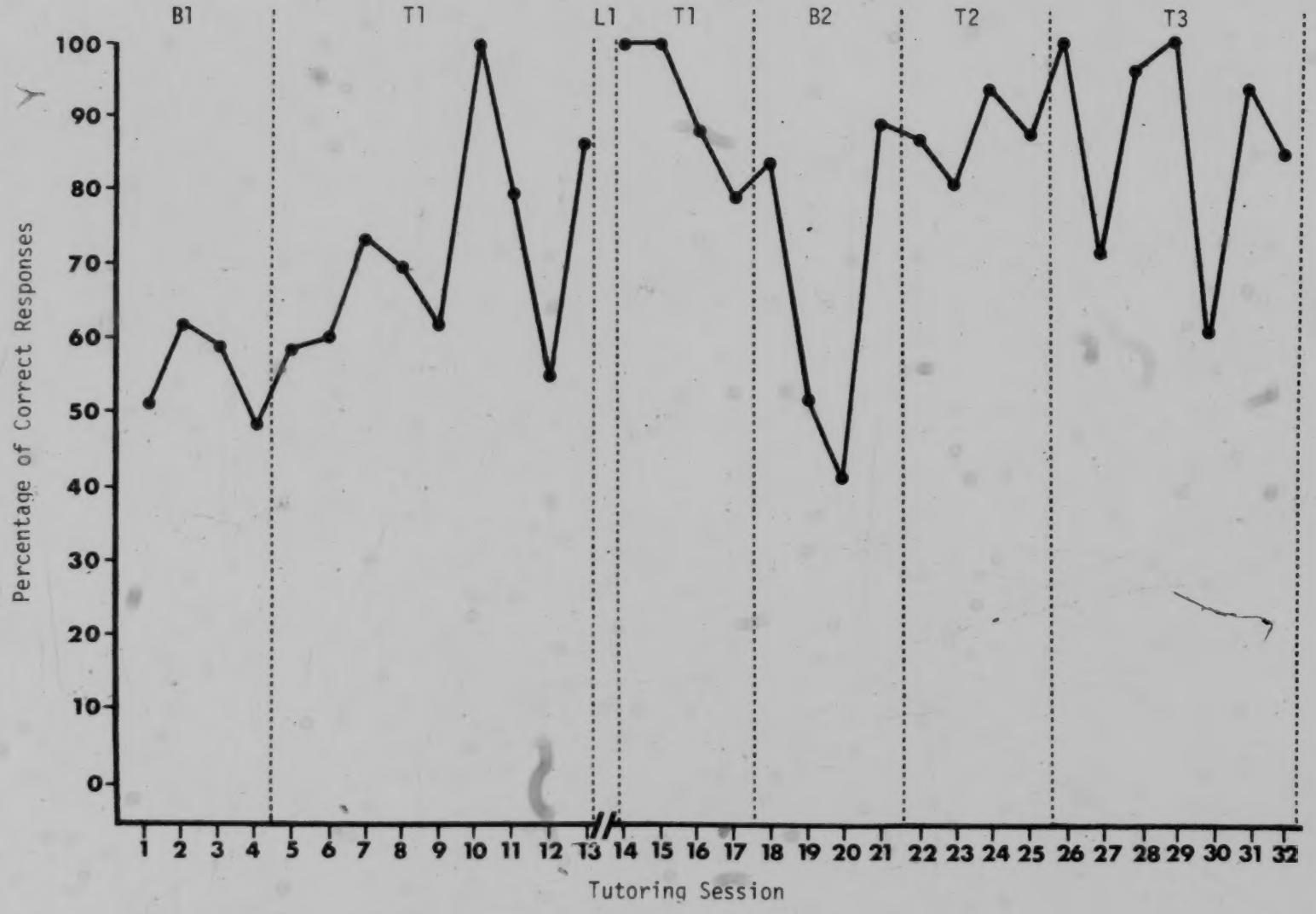

FIGURE 11. PERCENTAGE OF CORRECT RESPONSES PER TUTORING SESSION. (TUTEE C.)

Cumulative Number of Correct and Incorrect Responses Per Tutoring Session for Tutee C. On Figure 12 the cumulative number of correct and incorrect responses both showed a simultaneous increase throughout the B1 period and into the first week of the T1 period. After this first week of treatment there followed an increased rate of correct responding, while the rate of incorrect responding leveled off markedly.

During the B2 phase there was a slight increase in the rate of incorrect responding when both primary and secondary reinforcements were not given for correct responses. When social reinforcements were reinstated into the program, the rate of correct responding again increased. There was also a subsequent decrease in the rate of incorrect responding during this phase. The decrease in the rate of correct responding during the no-reinforcement phase, and the subsequent increase in the rate of correct responding when social reinforcement was reinstated during the T2 phase indicated that the behavior modification techniques (especially social reinforcement) employed were a controlling factor of C.'s behavior. Likewise, the increasing rate of correct responding continued throughout the T3 period.

Weighted Percentage Correct Per Week of the Program for Tutee C. Six target skills comprised C.'s program, but not all of them were emphasized every week of the tutoring project. This explains the lack of data for some of the target skills during specific weeks of the program. (See Appendix M for a detailed description of the target skills for Tutee C.)

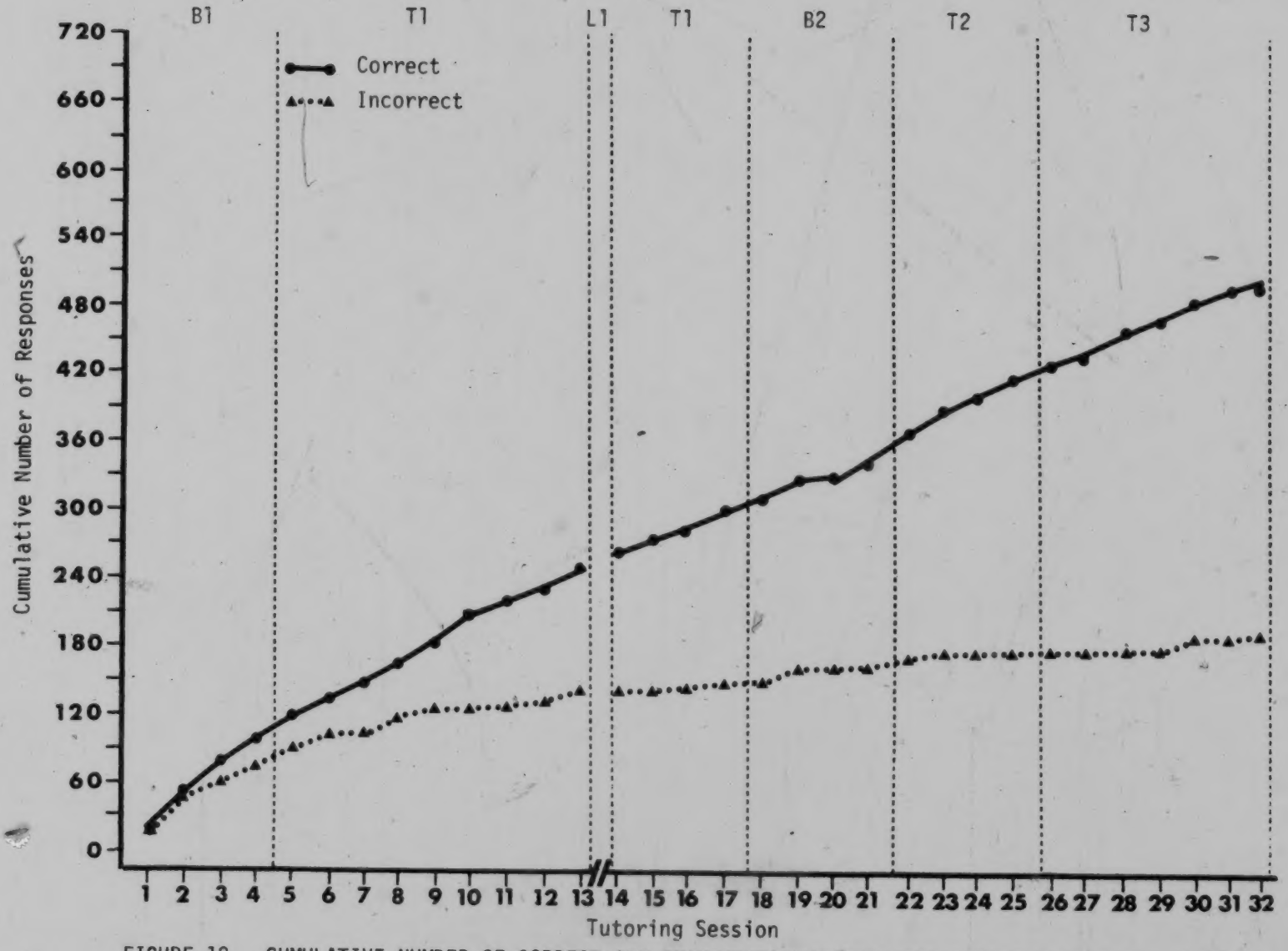

FIGURE 12. CUMULATIVE NUMBER OF CORRECT AND INCORRECT RESPONSES PER TUTORING SESSION. (TUTEE C.)

1. "Look at me." For the target skill "Look at me.", Figure 13 showed steady advancement during the T1 phase over the B1 phase. When all reinforcement was withheld, there appeared to be a substantial decrease in the weighted percentages correct. However, a return to the previous high level was recorded when social reinforcement was reinstated into the program. A decrease in the weighted percentage correct was seen again during T3, but the percentages remained above the initial baseline level. Table R-6 (Appendix R) indicated that substep 1 and 2 (out of six) were emphasized by C.'s tutors.

2. "Come to me." Figure 14 for the target skill, "Come to me.", showed a rather gradual increment in the weighted percentages of correct responses. There did appear to be a slight decrease in weighted percentages after the B2 period when no reinforcements were given for correct responses. This was followed by an increase in the weighted percentages for the T2 and T3 periods. Table R-7 (Appendix R) indicated that C. had reached substep 3 (out of six) of this target behavior by the end of the tutoring project.

3. "Take your sweater off." Figure 15 indicated that this target skill existed at a very consistent level in C., although her parents had indicated that they desired her to learn this skill. Table R-8 (Appendix R) indicated that some improvement was noted as evidenced by C.'s progression through the substeps of the target skill. She had initially been tutored at substep 1, and upon termination of the program had reached substep 6 (out of eight). Since there were no data collected during the B1 and B2 phases for this behavior, it was impossible to ascertain the effects of the

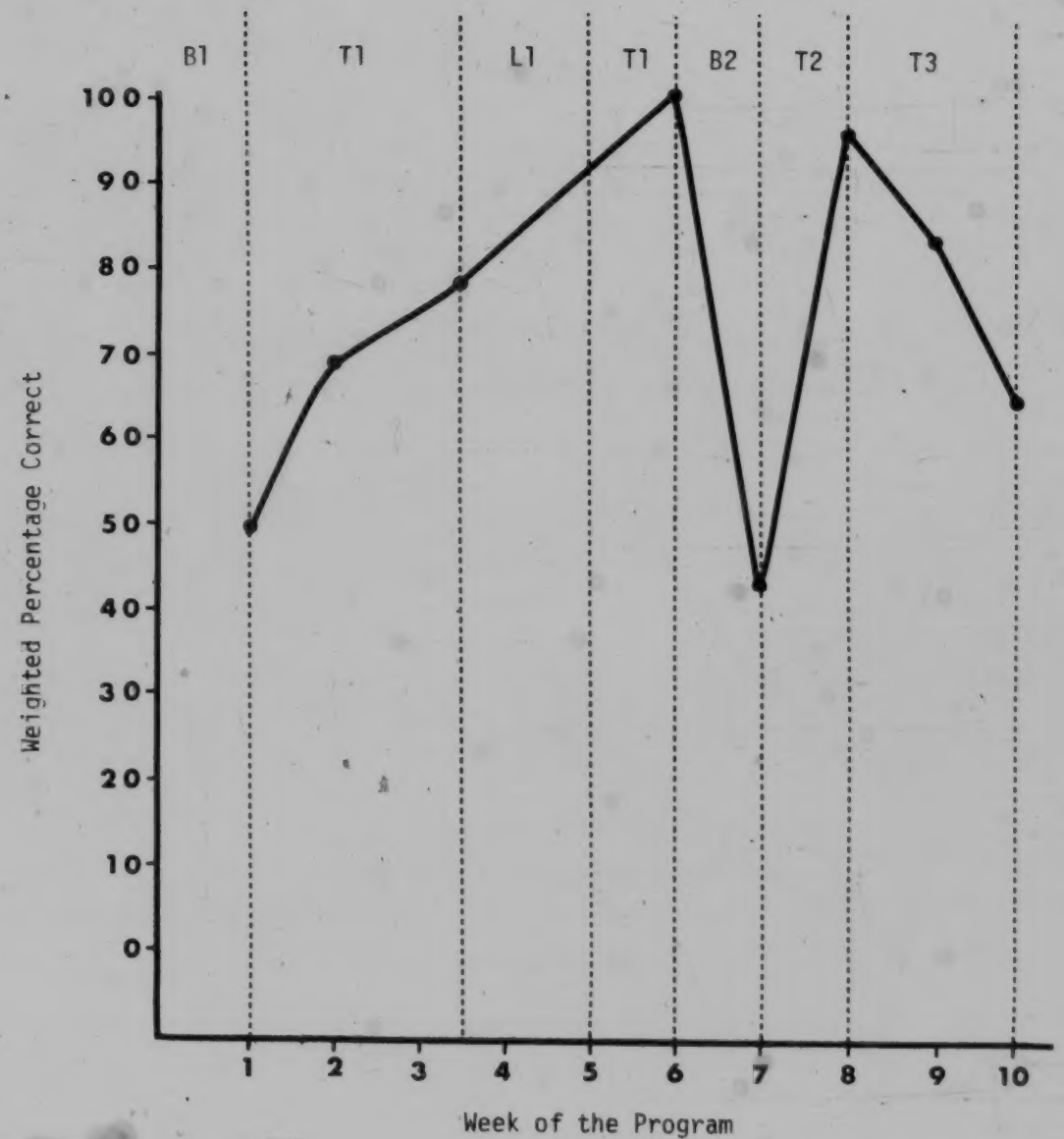

FIGURE 13. WEIGHTED PERCENTAGES CORRECT. TARGET SKILL "LOOK AT ME." (TUTEE C.)

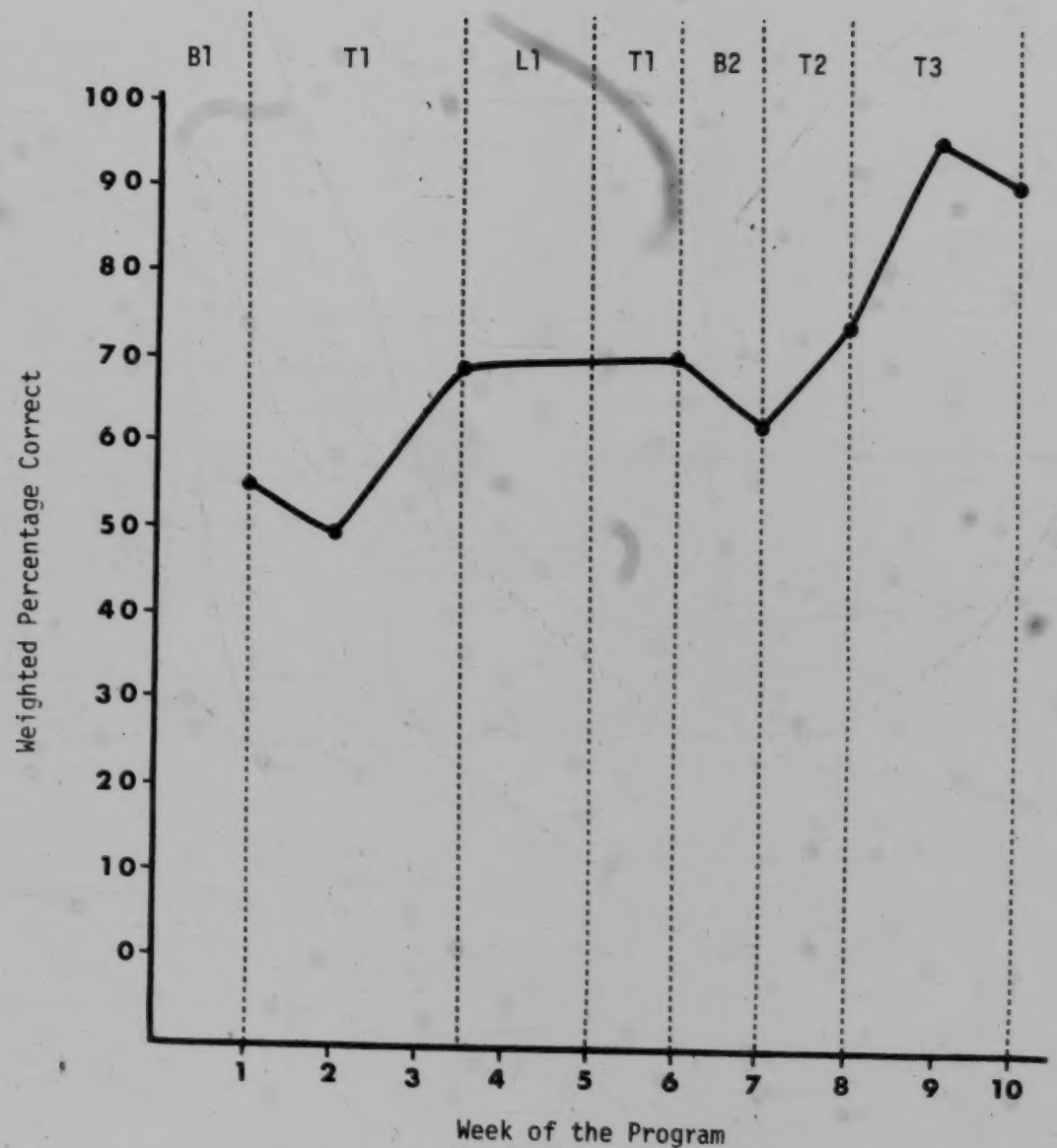

FIGURE 14. WEIGHTED PERCENTAGES CORRECT. TARGET SKILL "COME TO ME." (TUTEE C.)

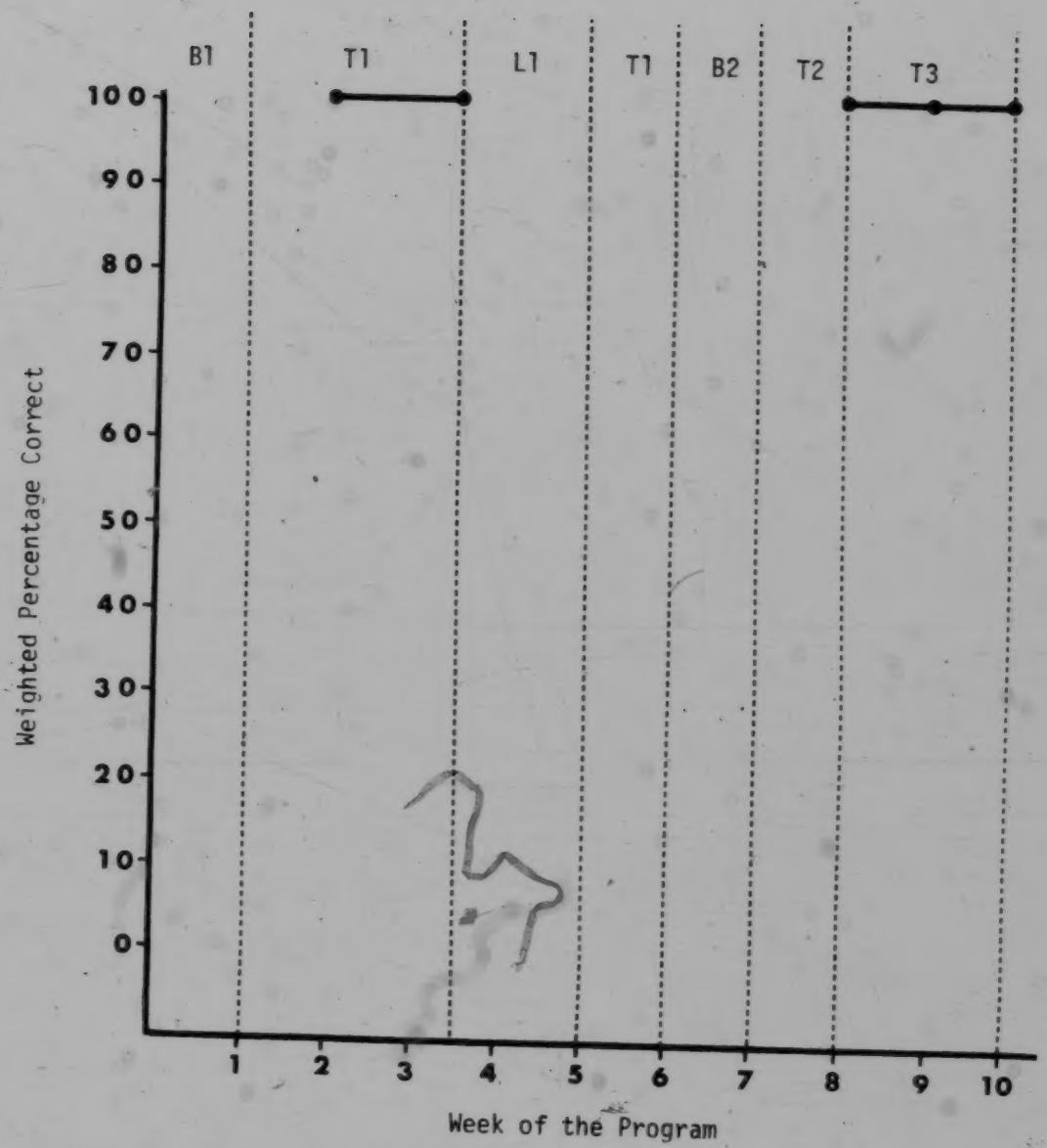

FIGURE 15. WEIGHTED PERCENTAGES CORRECT. TARGET SKILL "TAKE YOUR SWEATER OFF." (TUTEE C.)

reinforcement procedures used as tutoring technique for this particular behavior.

4. "Put your sweater on." It is difficult on Figure 16, to determine improvements in this target skill because of the lack of data during the B1 phase. However, Table R-9 (Appendix R), depicted some progression through the substeps comprising this target skill. During the first week (week 6) that C.'s tutors emphasized this skill at substep 1 through substep 5. At the end of week 8 the highest substep (8) for this target behavior had been reached. There did appear to be some evidence that the withdrawal of reinforcements had some effect on C.'s behavior; for there was a sharp decrement in the weighted percentage correct after the B2 period. This trend was immediately reversed when social reinforcement was reinstated into the program during the T2 phase.

5. "What is this?" Figure 17 for the target skill requiring C. to name objects from pictures showed no clear trends in the weighted percentage correct. In fact sporadic would best describe C.'s behavior on this task (Table R-10, Appendix R). Since this was a verbal task, it could reflect the variation noted in C.'s verbal activities. C. would also exhibit some perseverative verbal behavior by repeating one word to all the pictures with little regard to what was presented to her.

6. "Say yes." Very little data were collected for the target skill, answering yes, as seen in Figure 18. There was an initial improvement for the first week of the T1 period over the measures of the B1 phase. Since this target skill was only composed of one

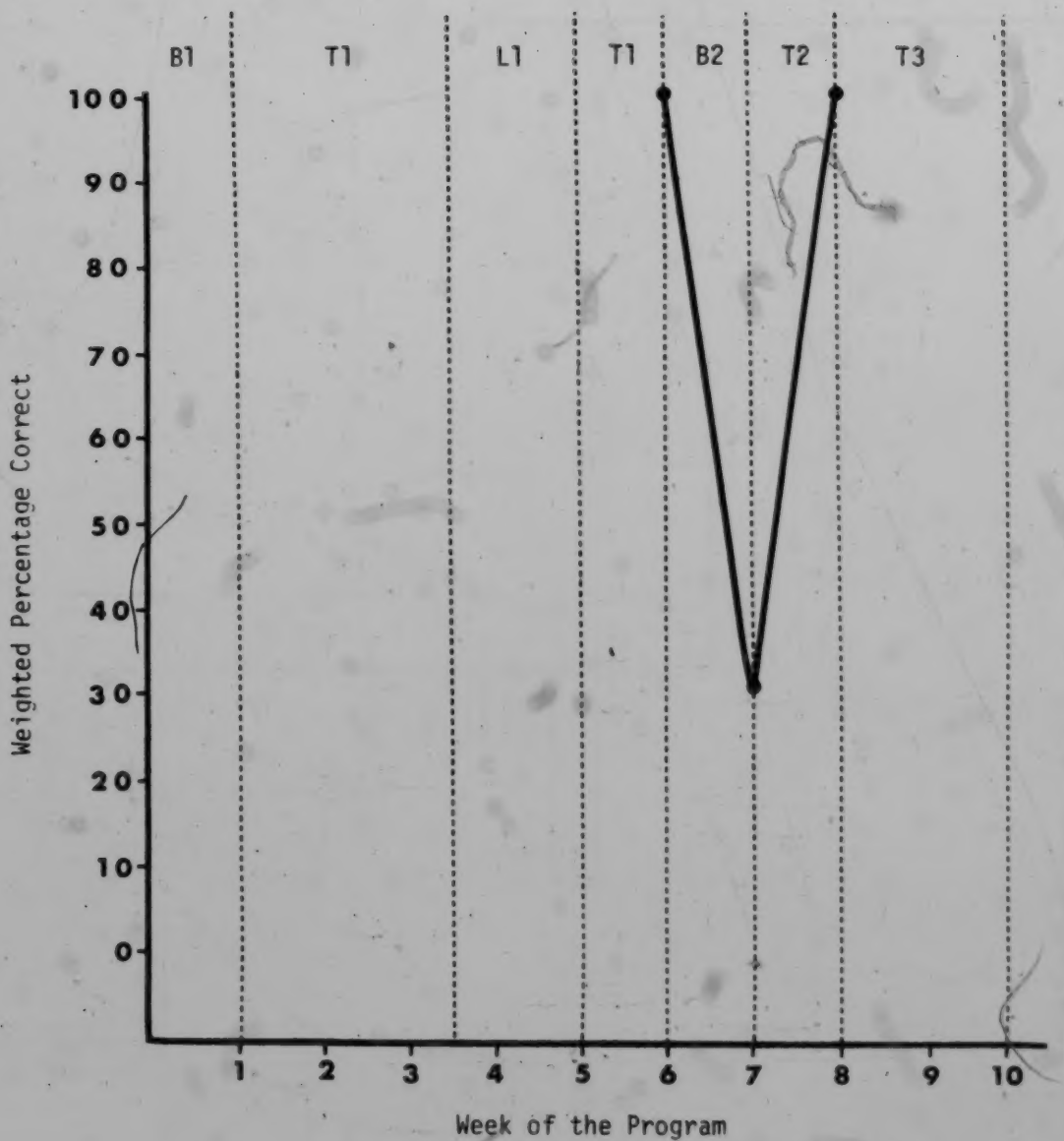

FIGURE 16. WEIGHTED PERCENTAGES CORRECT. TARGET SKILL "PUT YOUR SWEATER ON." (TUTEE C.)

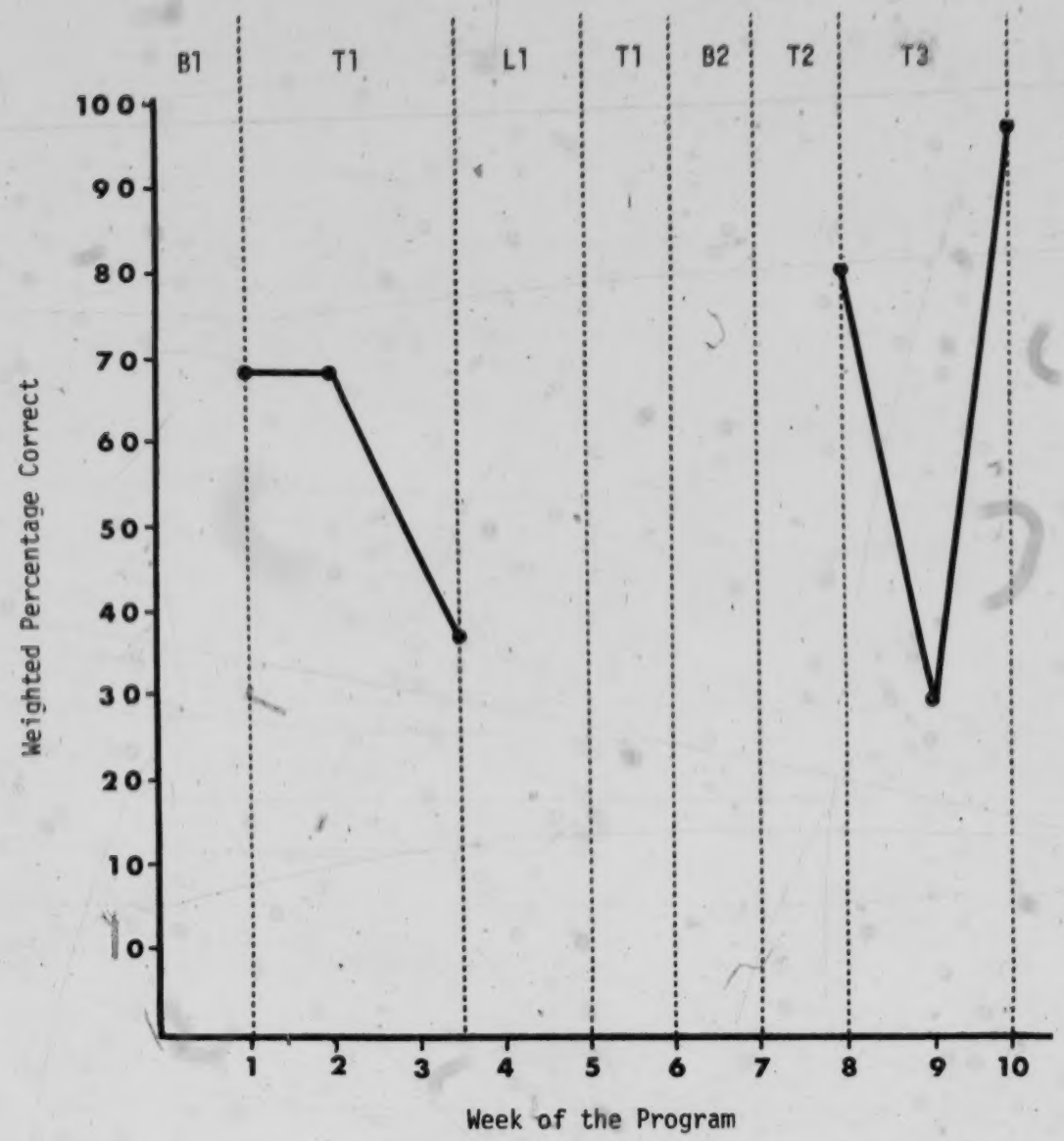

FIGURE 17. WEIGHTED PERCENTAGES CORRECT. TARGET SKILL "WHAT IS THIS?" (TUTEE C.)

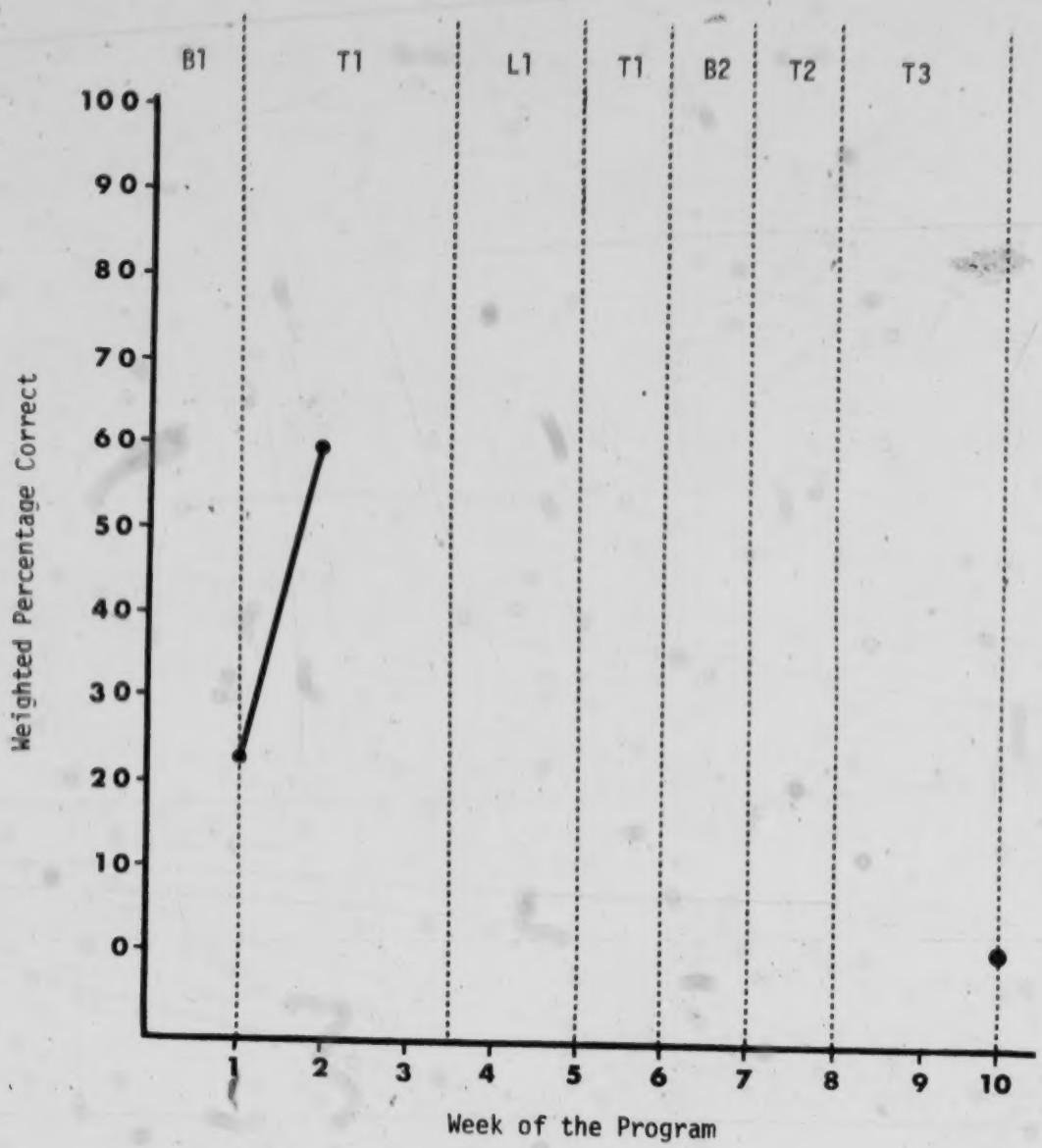

FIGURE 18. WEIGHTED PERCENTAGES CORRECT. TARGET SKILL "SAY YES." (TUTEE C.)

substep, no improvement can be noted by advancement through substeps (Table R-11, Appendix R). No other data were collected until the last week of the program. Therefore there was no information available on the effectiveness of the behavior modification techniques employed during the tutoring program. A weighted percentage of 0% was obtained during the last week, probably as a result of the lack of tutoring in this skill for the previous weeks.

In summary, it appeared that the weighted percentages correct for some target skills showed a general trend for improvement during the tutoring sessions. There was also some evidence that the behavior modification techniques did in some way contribute to the advancement.

Both the skills of paying attention and coming on command showed decreases in the weighted percentage correct during the no-reinforcement phase, and subsequently regained a high level when social rewards were reinstated into the program. Missing data on the four remaining target skills made inferring difficult. While there appeared to be improvement on the two skills of taking off and putting on a sweater, by progression through the substeps, nevertheless the evidence as to the efficacy of behavior management techniques is lacking. Putting the sweater on also showed a decrement in weighted percentage correct when primary and secondary reinforcements were withheld. The two verbal skills, naming objects from pictures and answering "yes," indicated no trends. On the first skill, responses appeared random, and on answering "yes," much data were missing.

Progress Tests for Tutee C. From Figure 19 it appeared as if C. had no target skills that were classified as learned skills before the initiation of the tutoring. This pattern continued throughout the T1 phase before Easter break. At the termination of the T1 period, C. had reached her peak performance with two target behaviors being classified as learned.

There was a subsequent decrease in the number of skills learned when both primary and secondary reinforcement were taken out of the program. This level was maintained after the T2 phase when only social reinforcement was used as a reinforcement for correct responses. Likewise, when both types of reinforcement were reinstated into the T3 phase, a decrease was noted instead of an expected increase in the number of learned skills. An increase of one learned skill was noted, however, after the L2 period.

It appeared, therefore, that there was an improvement over the initial baseline measures in the number of skills in which C. could perform the final goal behavior. The data on this graph, however, were inconclusive as to the efficacy of the behavior modification techniques used as a tutoring device in the present study.

Summary of Results for Tutee C. In general, C.'s results indicated that there was some general improvement throughout the duration of the program, especially in the skills involving following directions and dressing. The verbal activities showed little improvement and were marked by what appeared to be random responding. It could be that these target skills were ill-suited to C.'s verbal capabilities.

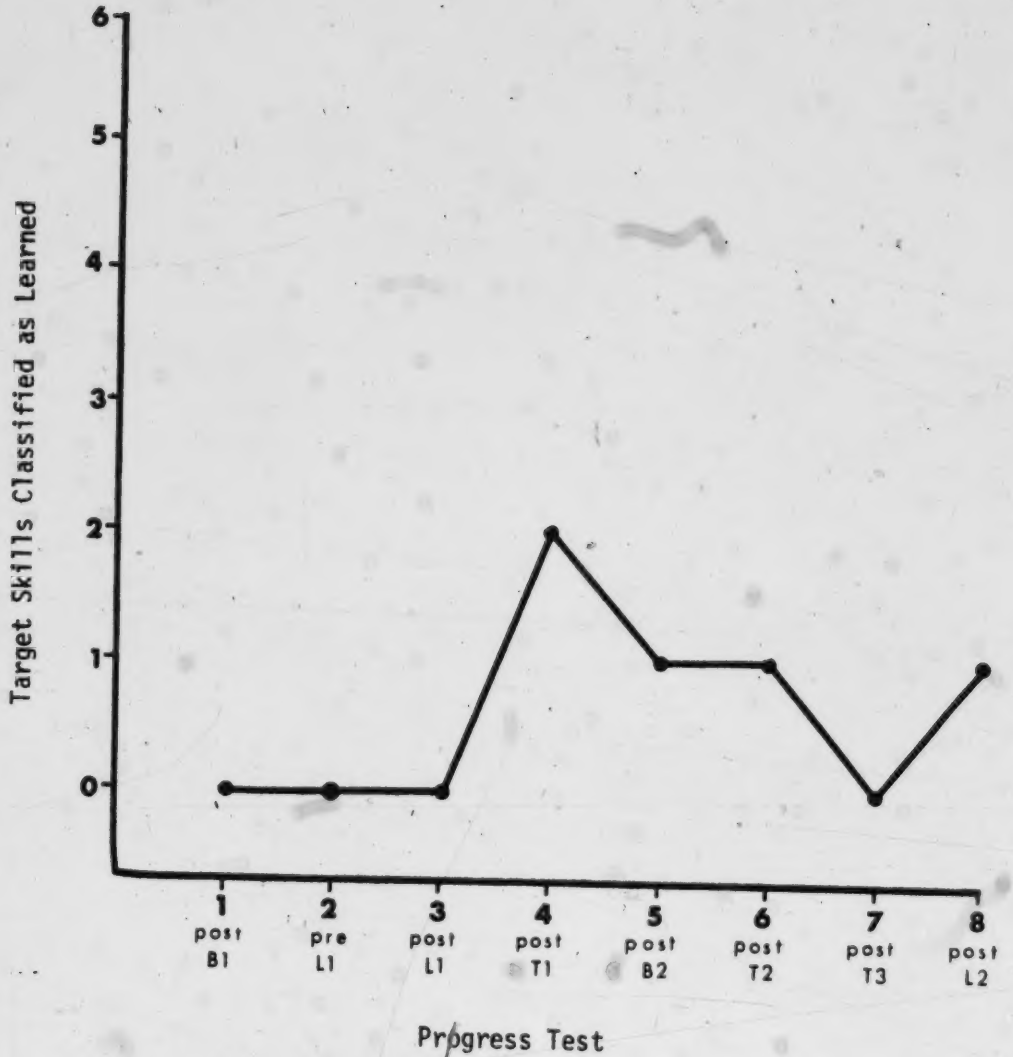

FIGURE 19. RESULTS OF PROGRESS TESTS. (TUTEE C.)

C.'s mother also indicated that improvement was noted at home in some of the skills that comprised her program. For instance, C.'s mother mentioned on the post-program questionnaire that C. "paid more attention when she was called, and enjoyed showing off when she removed her sweater." C.'s mother also reported increased social skills and a willingness on C.'s part to talk about the tutoring program at home.

The observation data collected also seemed to bear evidence concerning the improvement of C. The number of correct responses appeared higher than the number of incorrect responses in most tutoring sessions (Figure 10). Likewise, the number of incorrect responses decreased steadily throughout the program, finally reaching a low level. The only instance in which the number of correct responses became lower than the number of incorrect responses was during the phase when no reinforcements were given for correct responses.

The percentage of correct responses (Figure 11) also depicted a general increase throughout the program. The only substantial decrement in the percentage of correct responses occurred during the B2 period when reinforcement was withheld from the program. The percentage correct again climbed when social reinforcement was reinstated during the T2 phase.

The cumulative number of correct responses (Figure 12), likewise, indicated a progression through the program. The rate of correct responding became gradually greater while the rate of incorrect responding became quite low. A slight increase in the rate of incorrect responding was observed during the B2 phase when no

reinforcements were given for correct responses.

Varying degrees of advancement through the individual target skills comprising C.'s program were evident (Figures 13, 14, 15, 16, 17, 18). Both the skills "Look at me" and "Come to me" appeared to improve in terms of weighted percentages correct. Although the weighted percentages correct remained high for putting on and taking off a sweater, advancement was noted by progression through the various substeps in the two target behaviors. The two verbal skills of naming pictures and answering "yes" indicated no clear trends.

The skills "Look at me," "Come to me," and "Put your sweater on" all indicated that the behavioral principles used as tutoring method were in some way aiding C.'s performance. For instance, in all three skills a decrease in the weighted percentage correct during the B2 phase was observed. This decrease in weighted percentages correct was followed by a return to the previous high level when social rewards are reinstated during T2. However, inference is limited in the case of the two dressing skills because of the absence of baseline data (except on the Progress Tests).

A more global picture of C.'s progression through the tutoring program was obtained by plotting the number of target behaviors that could be classified as learned (Figure 19). The progress tests indicated that C. had increased the number of learned skills over the B1 phase. However, there did not appear to be any conclusive evidence as to the efficacy of the behavior modification techniques on this graph.

In summary, C. did improve in all aspects of the tutoring program measured, with the exception of the two verbal target skills. There was reported some generalization of several skills to the home environment. Supporting evidence was presented to substantiate that the behavior modification principles were effective in controlling C.'s behavior. Not only was this observed by a decrease in performance during the B2 phase in almost all methods of data presentation, but also in C.'s overt behavior. She enjoyed her ice cream treat as was indicated by her smacking her lips in anticipation, and after performing a desired behavior she would also actively seek out her social reward by hugging her tutors. Moreover, C. lapsed into some disruptive behaviors during the no-reinforcement phase. These behaviors disappeared when social rewards were reinstated.

Case Study 3: G.

Description. G. was 8 yrs. 11 mos. old at the beginning of the tutoring program. He weighed 44 lbs. and stood 3 ft. 9 in. tall. G. was diagnosed as having spastic cerebral palsy, with all four limbs involved. His legs were affected more, and, consequently, he was confined to a wheelchair. Although often slow and inaccurate, G. had fair manipulatory skills with his hands, but his movements, in general, were marked by spasticity and tremors. His eyesight was also poor, and, in consequence, he wore glasses.

G. was able to scoot himself along the floor, and he enjoyed playing on some of the gymnasium equipment with his tutors. His arms appeared quite strong, for he was able to propel himself in his

wheelchair and also to open doors while sitting in it.

G. was able to express himself quite readily and understand most of what was asked of him. Because of his disability, G.'s speech was marked by a very staccato rhythm, which made most of his words very clear and precisely enuciated. A few articulation errors, common to younger children, were present; but on the whole his language and speech development were relatively advanced. He usually answered in whole sentences and was quite capable of initiating conversations. Although concrete happenings were the main topics of conversation, G. did on occasion refer to more abstract matters, telling for instance, how he felt about certain occurrences. G. had a good memory for people's names and could relate past experiences as well as anticipate future events.

Emotionally G. appeared fairly stable, for he usually appeared quite happy and pleasant and was easy to motivate. He had a well-developed concept of social rules and could anticipate the consequences of his actions. Similarly, it was possible to explain to G. what behaviors were expected of him and why they were important. Another salient characteristic of G. was his independence. He usually refused any sort of help in propelling his wheelchair or in opening doors. This perseverance pervaded all his actions almost to the point of apparent obstinancy.

Socially, G. was quite advanced in that he could react adaptively in social situations and manipulate other people. He had extremely good rapport with his tutors and appeared to enjoy their company immensely. His good memory for names and faces aided him in his

social interactions.

G. was extremely fond of his father whose work often required him to be away from home for long periods of time. G.'s mood would often depend on where his father was at any time. For instance, he would be in an extreme state of elation when his father was to come home and very depressed when his father had to leave again. This swing of moods would sometimes affect his behavior during the tutoring sessions. Affection for his father also appeared to affect G.'s home behavior in that he was sometimes less independent at home in order to gain the attention of his father.

Adaptive self-care behaviors existed at a fair level in G., although he was limited by his physical handicap, he could manipulate his food adequately. He was also able to drink from a cup if it was not too full, but could not complete any pouring activities. Initially, G. was very slow to eat. This tardiness was remedied by reinforcing him with extra smarties and the promise of a walk if he finished his lunch on time. His dressing skills, although present, were limited and usually required a great deal of effort to complete. G. was adequately toilet-trained.

Assessing G.'s intellectual ability was a difficult matter in that there appeared to be discrepancies among his social, motor performance, language, and academic abilities. His physical capabilities were obviously below the norm as would be expected because of his physical handicap. Likewise, he did not appear equal to the norms for certain verbal intelligence test items having to do with number concepts, general information and the like. In fact, he did not

appear to especially enjoy any activities of these kinds. On the other hand, although perhaps somewhat naive for a nine-year-old, he did have relatively good comprehension of social interactions, especially compared to most of the other children in the school. It appeared, therefore, that in adaptive, social, and language behaviors G. was functioning at a higher level than would be expected in view of his school placement. His physical incapabilities, lack of experience, and lack of motivation for cognitive and/or academically-oriented tasks probably would depress his score on a standardized test of mental ability. G. seemed to be functioning therefore, both on a trainable and educable level (depending on what behaviors were being assessed) according to the Adaptive Behavior Classification System (described in Heber, 1961).

Program. G.'s program consisted of three self-help skills and two basic academic skills. The two academic skills were added by G.'s teacher because the three self-help skills appeared to be in G.'s behavioral repertoire while at school, but were not always present at home because G. was seeking attention from his father. The self-help skills were retained as part of the program to provide an opportunity for G. to practice them, since he was slow and inaccurate. Therefore, the target skill included in G.'s program were (a) putting on socks ("Put your socks on."), (b) putting on a sweater ("Put your sweater on."), (c) washing and drying hands ("Wash your hands."), (d) recognizing numbers 1-10 ("What number is this?"), and (e) telling time ("What time is it?"). (See Appendix N for G.'s program in detail.)

Materials. The materials and apparatus used in G.'s tutoring

program consisted of:

1. Smarties - small candies used as primary reinforcement for correct responses.
2. Tissue paper - standard equipment.
3. A pair of socks - bulky type, used in teaching G. how to put on his socks.
4. Sweater - pullover type owned by G., used in teaching G. how to put on his sweater.
5. Small plastic tub, towel, and soap-on-a-rope - used in te teaching G. how to wash and dry his hands. The soap was put on a rope to enable G. to wash his hands without losing it, since his spasticity made holding onto the soap very difficult.
6. Ten, 3 1/2 in. squares of red cardboard on which were printed the numbers 1 through 10 (one number per card), used in the counting exercises.
7. A red, rectangular (10 in. x 11 in.) piece of cardboard on which was printed the face of a clock with a movable hour and minute hand, used in teaching G. to tell time.

Number of Correct and Incorrect Responses Per Tutoring Session for Tutee G. Figure 20 indicated that for the first part of the B1 period G. had a fair number of correct responses with a corresponding low number of incorrect responses. By checking the daily observation records it was discovered that the tutors had emphasized those self-help skills that were later found to already be a part of G.'s behavioral repertoire.

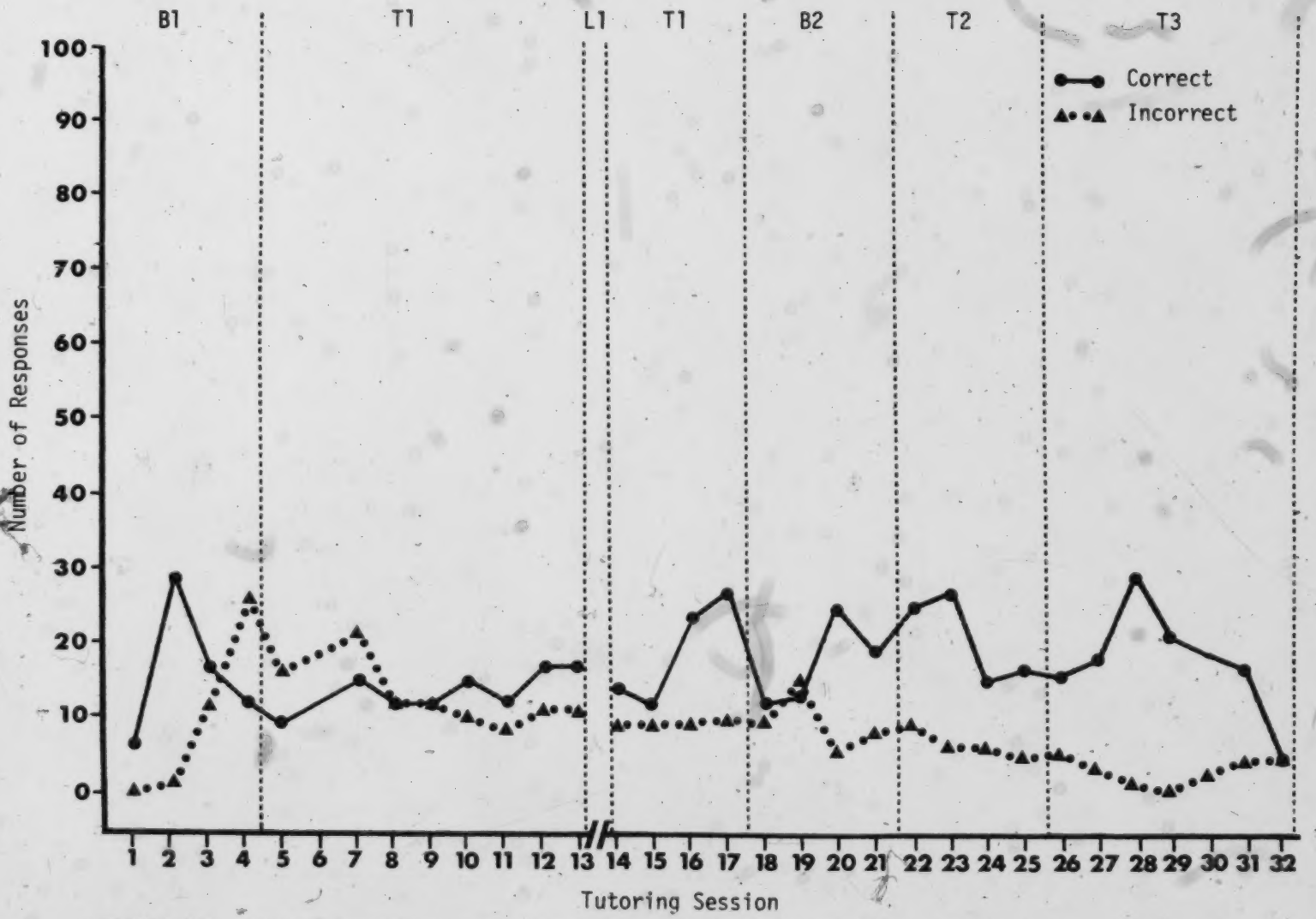

FIGURE 20. NUMBER OF CORRECT AND INCORRECT RESPONSES PER TUTORING SESSION. (TUTEE G.)

During the first week of the T1 period the number of correct responses was lower than the number of incorrect responses. Perhaps this represented a more realistic description of G.'s capabilities than the B1 data. By the second week of the T1 phase the number of correct responses became greater than the number of correct responses.

When primary and secondary reinforcements were withheld during the B2 phase, there was a subsequent decrease in the number of correct responses and an increase in the number of incorrect responses. This decrement in the number of correct responses only was observed on one day of the B2 phase. The rest of the program, except for the last day of tutoring, was marked by a high number of correct responses, and a low number of incorrect responses.

A disruptive behavior was also noted during the B2 phase when reinforcements were withheld for correct responses. This was the return of G.'s extremely slow eating patterns. When social reinforcement was reinstated this behavior disappeared indicating that social reinforcement was in some way affecting G.'s behavior, not only during the tutoring session, but also outside the actual tutoring session.

There did seem to be a general trend of improvement throughout the program as indicated by the number correct in Figure 20. The decrease in the number of correct responses during the B2 phase and the increase of G.'s slow-eating behaviors during the same phase gave some evidence for the controlling factor of the reinforcements used. The data seem to indicate that social reinforcement was more motivating for Tutee G. than primary reinforcement.

Percentage of Correct Responses Per Tutoring Session for Tutee G. The initial baseline measures as depicted in Figure 21 were again high in terms of percentages correct because of the emphasis on simple skills. There was a decline in the percentages correct after the first few days of the B1 phase when more difficult skills were tutored. In general, however, the percentage correct did become higher during the treatment periods, indicating a pattern of improvement throughout the program.

Again, evidence indicating the controlling factor of the reinforcement techniques on G.'s behavior was noted on Figure 21. There was a marked decrease in the percentage correct during the B2 phase. However, this decrease only was maintained for one day; so results were again inconclusive. Another decrease in performance was also present during the last week of the tutoring program.

Cumulative Number of Correct and Incorrect Responses Per Tutoring Session for Tutee G. Figure 22 also depicted a general trend of improvement in the rate of correct responding. It was not until after the L1 period during the first treatment phase that the slope of the line representing the rate of correct responding became noticeably steeper than the slope of the line representing incorrect responding. Up to that point the rate of correct responding and the rate of incorrect responding were increasing in a parallel manner.

During the B2 phase when no reinforcements were given for correct responses, the rate of incorrect responding increased, an indication that the use of reinforcement principles did have an effect on G.'s behavior. For the remaining part of the tutoring program there

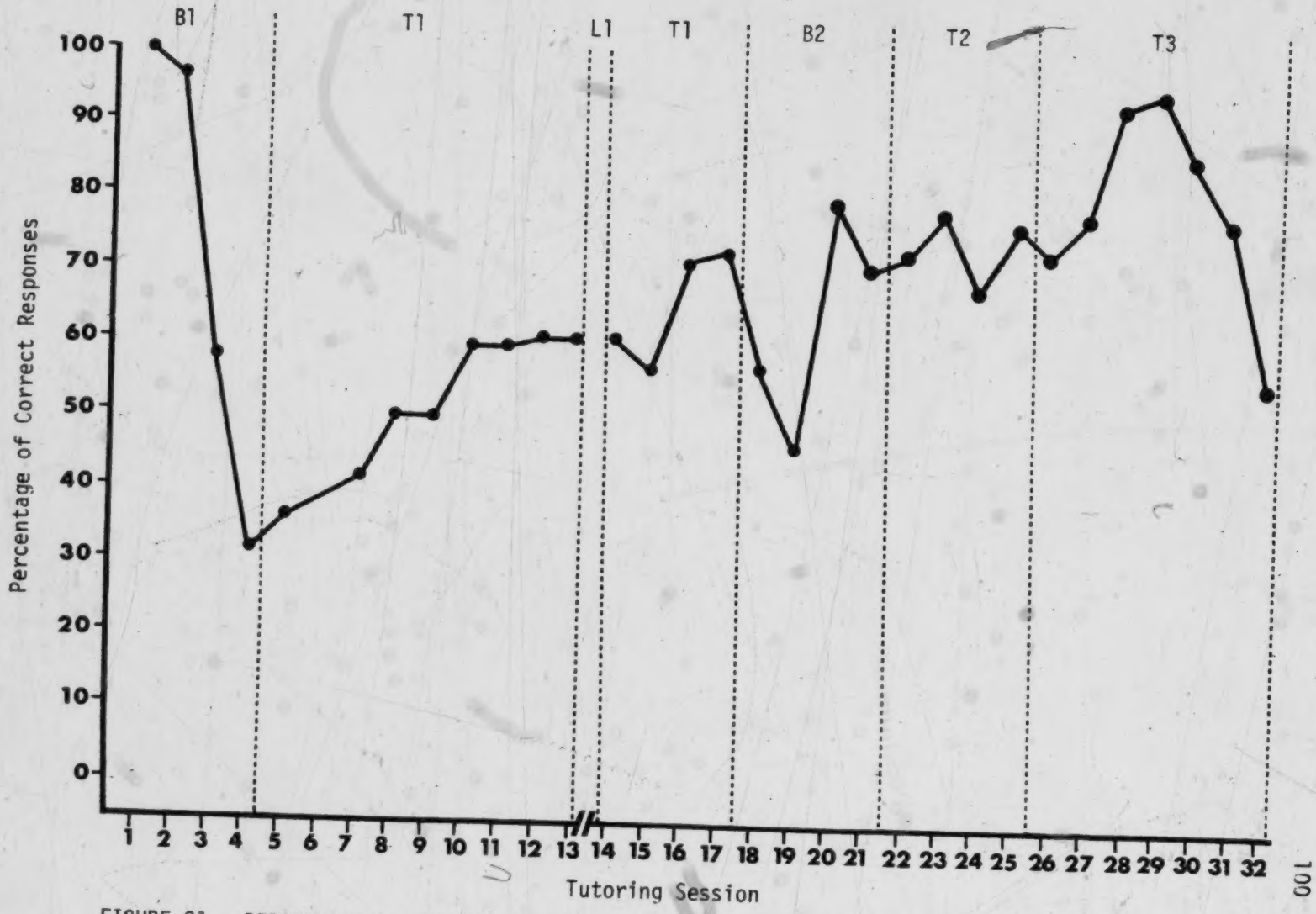

FIGURE 21. PERCENTAGE OF CORRECT RESPONSES PER TUTORING SESSION. (TUTEE G.)

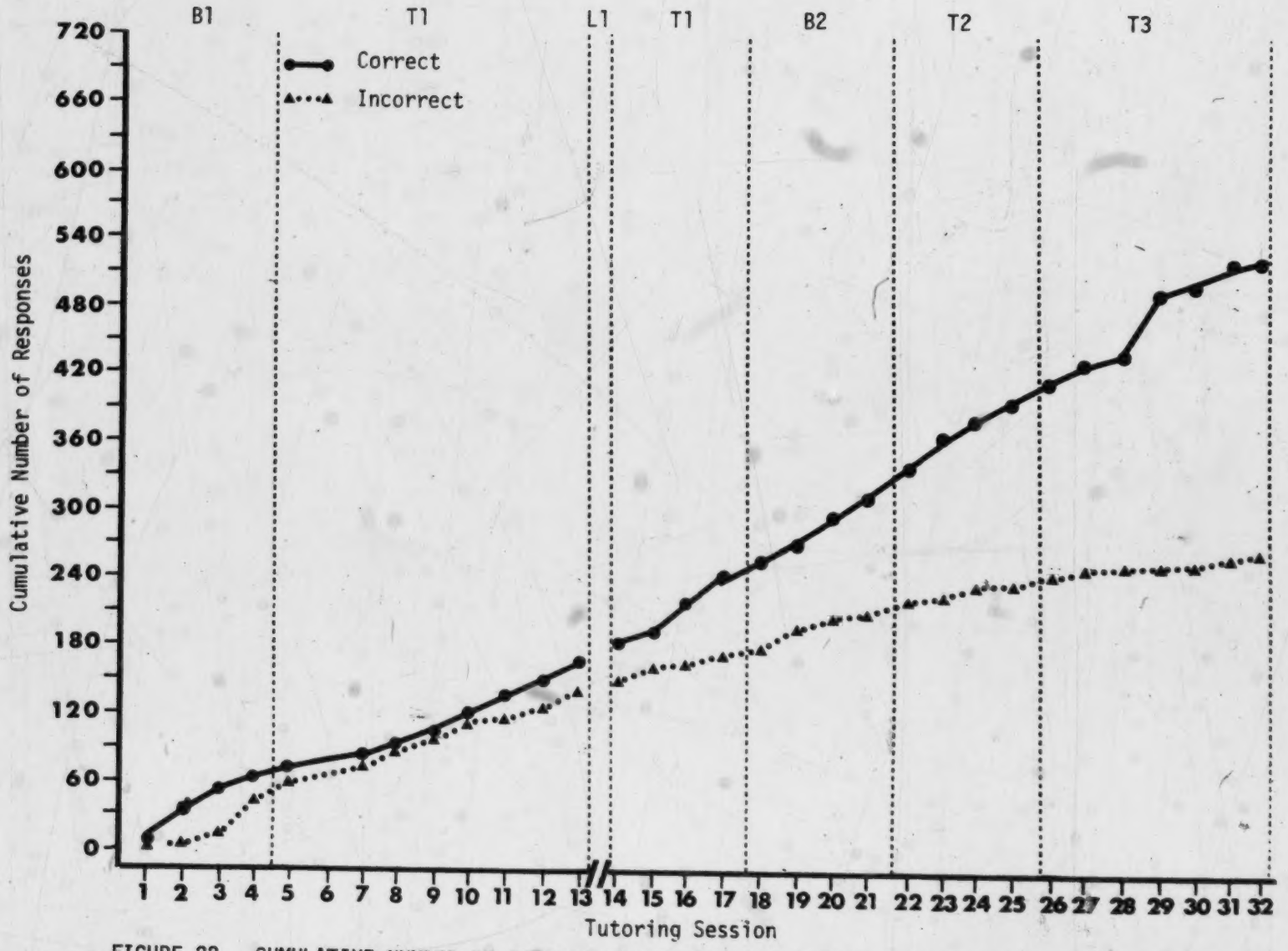

FIGURE 22. CUMULATIVE NUMBER OF CORRECT AND INCORRECT RESPONSFS PER TUTORING SESSION. (TUTEE G.)

appeared to be an increase in the cumulative number of correct responses and a decrease in the cumulative number of incorrect responses which indicated some improvement in skills during the tutoring program.

Weighted Percentages Correct Per Week of the Program for Tutee G. A problem of lack of data was involved in three of the five target skills comprising G.'s tutoring program. Since G. could already wash his hands and put on his sweater, these skills were reserved for practice only during the administration of the progress tests. These skills were kept in the program because the experimenter felt that G. needed practice in these self-help behaviors since his spasticity limited his quickness in accomplishing dressing skills. More drill was needed in the skill "Put on your socks." However, it was often impossible to tutor or administer progress tests for this target behavior because G. often wore braces which were too cumbersome to remove easily.

The weighted percentages correct for each target skill follows:

1. "Put on your socks." This skill was only emphasized by the tutors during week 1 and week 8. (For this reason there is no graph representing these data.) In both instances the weighted percentage was 100% at substep 1. Because of the lack of data, it was impossible to determine improvement or the effects of reinforcement for this target skill. (See Table R-12, Appendix R.)

2. "Put your sweater on." There were no data collected for this skill except during the administration of the progress tests. The progress tests indicated that G. had obtained the final goal behavior for this target skill.

3. "Wash your hands." There were no data collected for this skill except during the administration of the progress tests. The progress tests for this target skill also indicated that G. had reached the final substep.

4. "What number is this?" Figure 23 presents the weighted percentage of correct responses for the target skill of recognizing the numerals 1-10. It appeared that there was little change throughout the program in this skill in terms of weighted percentages correct. No significant decrease in the weighted percentage of correct responses was noted when both types of reinforcements were withheld during the B2 phase, or when only primary reinforcements were withheld during the T2 phase.

There was some progress through the various substeps of this target skill. Initial tutoring was emphasized only at substep 1; while upon termination of the project, tutoring was accomplished almost exclusively at substep 3.

5. "What time is it?" There did appear to be a general trend of improvement on Figure 24 for the weighted percentage correct for this target skill. G. progressed steadily from a very low level to a near perfect weighted percentage upon termination of the program. Likewise, Table R-14 (Appendix R) indicated an advancement through the various substeps of the target behavior. All the tutoring during the initial weeks were accomplished at substep 1, while upon termination of the tutoring project much of it was accomplished at substep 3.

There also appeared to be some evidence that the behavior modification techniques were effective in controlling this behavior. A

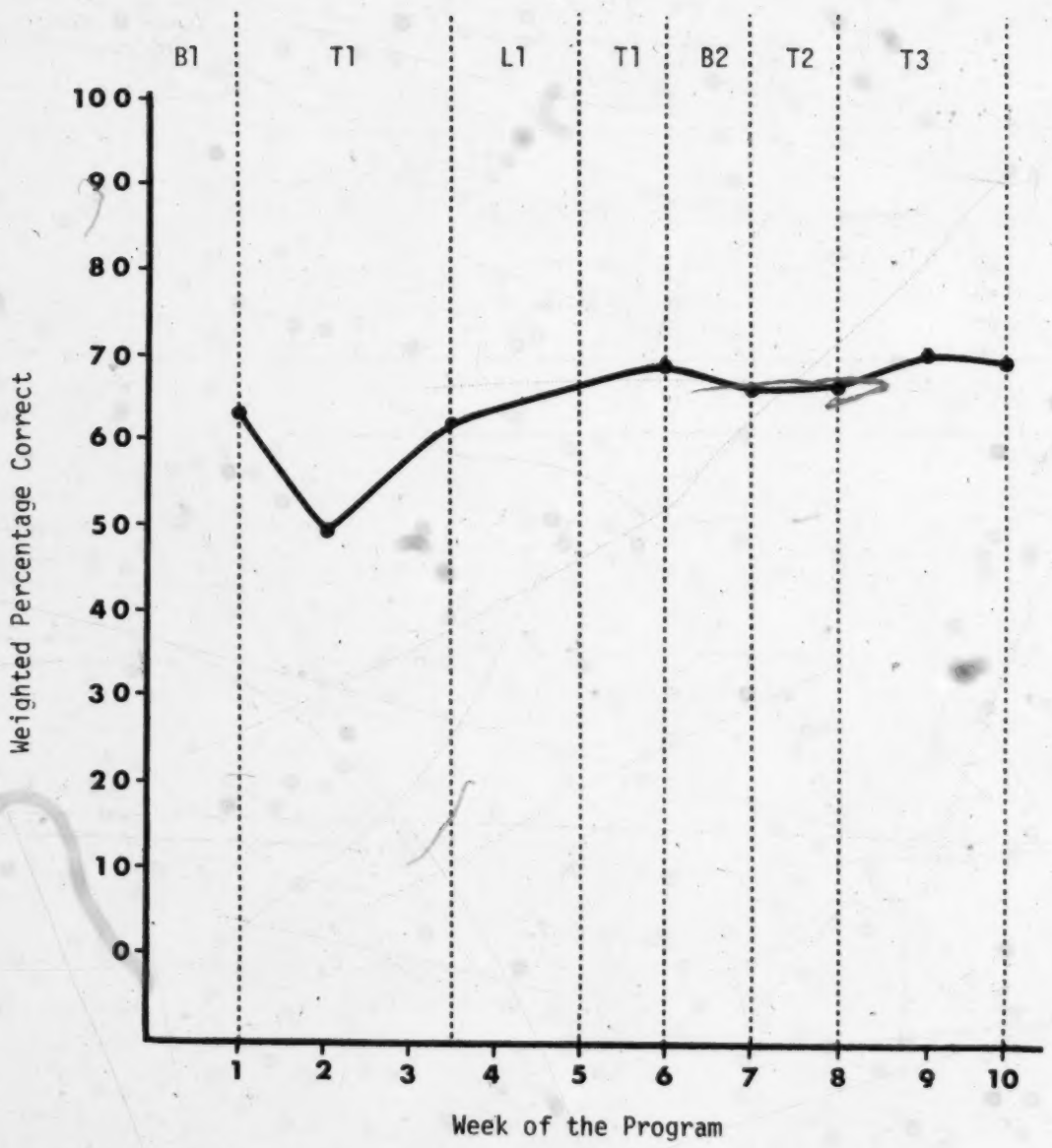

FIGURE 23. WEIGHTED PERCENTAGES CORRECT. TARGET SKILL "WHAT NUMBER IS THIS?" (TUTEE G.)

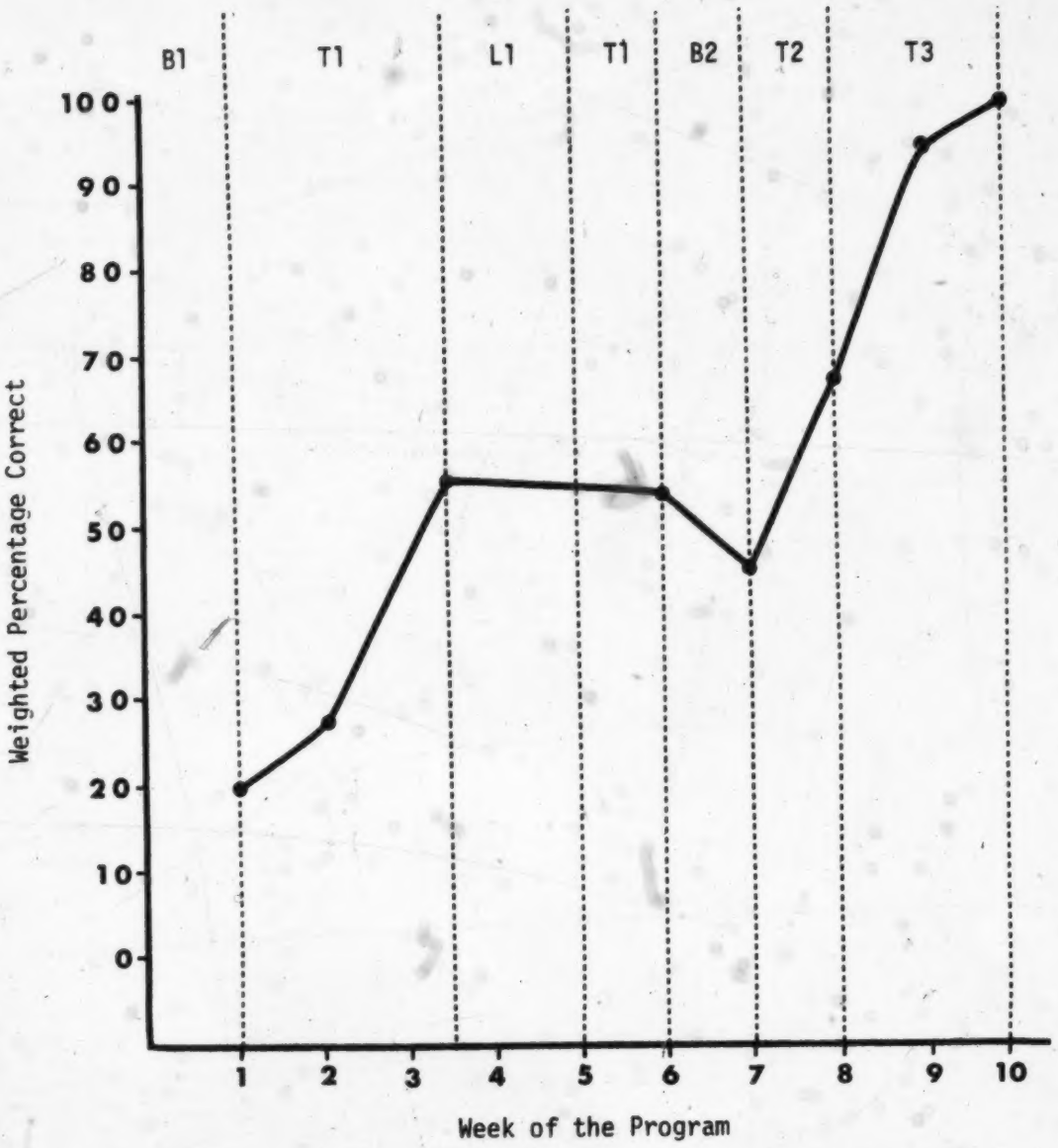

FIGURE 24. WEIGHTED PERCENTAGES CORRECT. TARGET SKILL "WHAT TIME IS IT?" (TUTEE G.)

slight decrease in the weighted percentages correct was noted at the end of the B2 phase when both reinforcements were withheld. The weighted percentages correct increased sharply when social rewards were reinstated into the T2 period.

In summary, the weighted percentages correct seemed to indicate improvement for only one of the target behaviors - telling time. Although the target skill of recognizing the numerals 1-10 did not show improvement in terms of weighted percentages correct, there was progression through the various substeps of the skill. The effect of the behavior modification techniques was only evidenced as a slight decrease in the weighted percentages correct in the telling of time activities when both types of reinforcement were withheld from the program. Not enough data were available to make inferences concerning the development of the three self-help skills included in G.'s program.

Progress Tests for Tutee G. Looking at a more global picture of G.'s progress on Figure 25, little improvement was noted. There was a slight increase in the number of skills classified as learned after the T2 phase when social reinforcements were reinstated into the program after a period of no-reinforcement (both primary and secondary). This indicated that reinforcement (especially social) was perhaps effective in controlling G.'s behaviors.

The lack of improvement on this figure is somewhat explained by the fact that G. did not reach any of the final goal behaviors in the academic skills in his program. Although he did exhibit advancement through the substeps comprising the academic skills, Figure 25 would

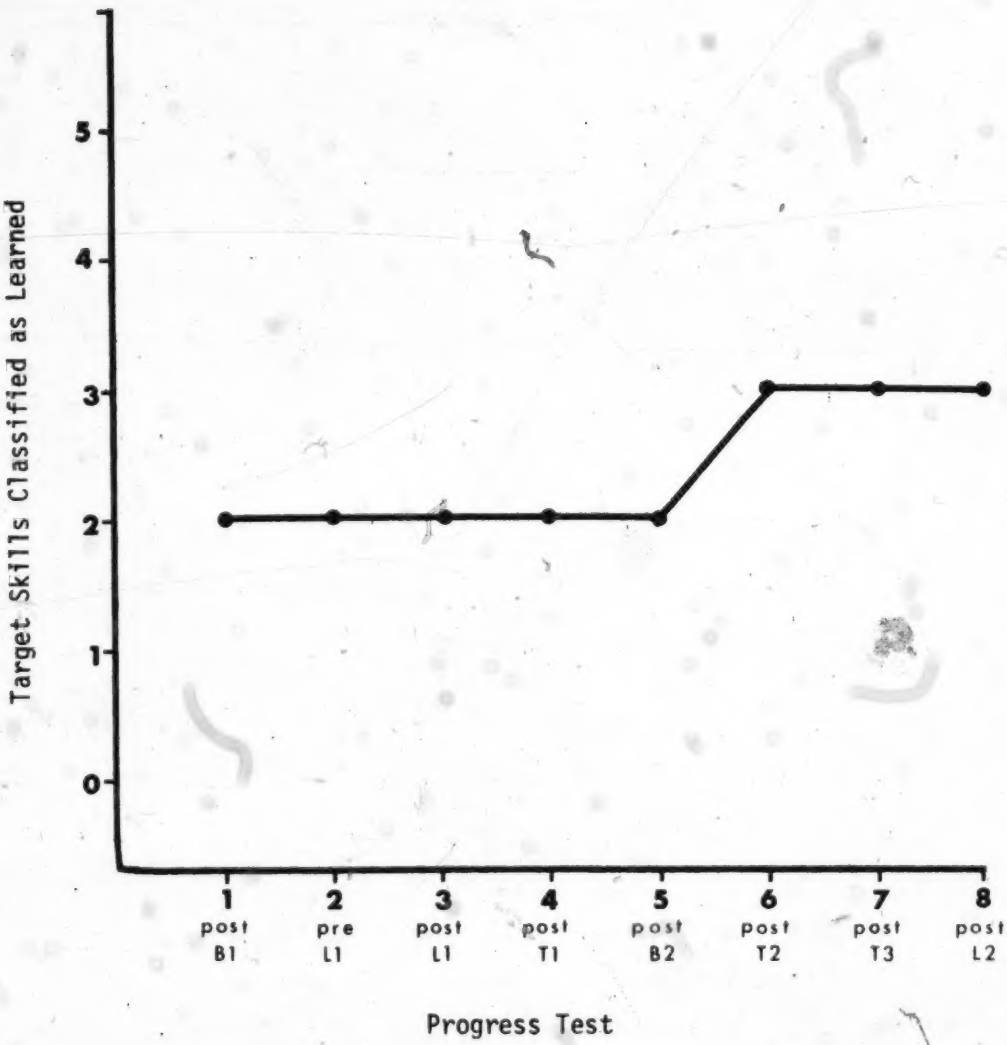

FIGURE 25. RESULTS OF PROGRESS TESTS. (TUTEE G.)

not show such fine improvements. These results are also somewhat confounded by the fact that on many occasions the skill of putting on socks could not be measured because G. was wearing braces.

Summary of Results for Tutee G. Although some variation in results was observed, most of the data indicated a general trend of improvement for Tutee G. in the two academic target skills. G.'s mother also stated that G. was more willing to dress and undress himself at home. This generalization of response to situations outside the tutoring experience occurred even when emphasis on dressing skills was limited to the administration of the progress tests.

Figure 20, depicting the number of correct and incorrect responses per tutoring session, showed that for the academic skills the number of correct responses became greater than the number of incorrect responses. There was also some indication that the behavior modification principles were effective in producing the positive change for G.; for his performance decreased when reinforcement was withheld during the B2 phase. When social reinforcement was reinstated into the T2 period, G.'s performance increased to its previously high level.

Likewise, the percentages of correct responses (Figure 21) increased during the treatment periods of the program. A decrease in the percentage correct was noted during the B2 phase, indicating the importance of the reinforcements used. The return of high percentages correct during the T2 period when social reinforcement was reinstated appeared to indicate that G. was more motivated by social reinforcement than primary in learning to recognize numbers and

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tell time.

The cumulative number of correct responses generally was higher than the cumulative number of incorrect responses throughout the program. The rate of correct and incorrect responding both increased at a parallel rate during the T1 phase before Easter break. After the Easter break the rate of correct responding increased markedly, while the rate of incorrect responding decreased. This pattern continued throughout the duration of the tutoring project, except during the B2 phase when no reinforcement was given for correct responses. During this period there was a increase in the rate of incorrect responding.

The weighted percentages correct indicated varying degrees of improvement (Figures 23, 24). The self-help skills of putting on a sweater and washing hands were not emphasized during the tutoring except during the administration of the progress tests. More tutoring was needed on the skill of putting on socks. However, since G. often wore braces, training was limited on this skill.

The performance on two academic skills in G.'s program showed differential development. G. did not seem to improve in the skill of recognizing the numerals 1 to 10 in terms of weighted percentages correct. However, there was progression through the various substep levels. The skill of telling time appeared to improve both in terms of substep level and the weighted percentage correct. There was also a slight decrease on this skill in terms of the weighted percentage correct during B2 phase when both types of reinforcement were withheld.

The progress tests (Figure 25) indicated little improvement, with the exception of after the T2 phase when social reinforcement was reinstated into the program. Since this figure could only depict attainment of the final goal behavior, finer gains on the two academic skills were not evident.

Although G. did not reach the final goal behaviors of the academic skills during the tutoring program, some progress was made, indicating that perhaps this method of tutoring had possibilities with Tutee G. He did appear somewhat under the control of the reinforcements used, as evidenced by a decrease in performance during the no-reinforcement phase. G.'s objectionable behavior of eating extremely slowly also returned during the no-reinforcement period. His performance on the tutoring tasks as well as his behavior outside of the tutoring session improved when social reinforcement was again given for correct responses. The social reinforcement, therefore, appeared to be a more effective reinforcer in G.'s case.

Case Study 4: J.

Tutee J. was an 8 yr. 1 mo. old girl of Eskimo origin from the Northwest Territories, Canada. She resided in a foster home in Edmonton with several other handicapped children. She was 4 ft. 2 in. tall and weighed 58 lbs. Triplegic spastic cerebral palsy, affecting both legs and her left arm, confined J. to a wheelchair. She also wore eyeglasses to correct myopia.

Because of her disability, J. was not adept at gross physical activities. However, she could propel herself in her wheelchair and

had recently learned how to stand on her feet, supported by the sink, to wash her hands. Despite her inability to manipulate objects with her left hand, she was fairly dexterous with her right hand and arm. J.'s teacher also reported that J. was progressing in activities involving movement of the arms, including catching and throwing a ball.

Language was relatively well developed in J. (although not at such a high level as Tutee G.). J. was able to understand everything that was told to, or asked of her, provided that the communication was not at an abstract level. Her expressive language was also developed in that she could initiate conversation, relate previous experiences, and give commands to other individuals. She was capable of speaking in whole sentences, but would often lapse into phrases of a few words. Most of the topics J. conversed about were concerned with concrete occurrences or objects. She would not attempt more abstract subjects unless she was asked a particular question. J.'s articulation was very immature for an 8 yr. old. Her speech was marked by many substitution and omission errors (Van Riper, 1963) which often made it difficult to understand her.

More than any of the other tutees (with perhaps the exception of G.) J. seemed especially happy during the tutoring sessions. Although she was often shy, she seemed to enjoy the company of her tutors and would often command them to do small favors for her. It appeared to please her when these little tasks were carried out by her willing tutors. Living in a home with several other handicapped children and being in a classroom with 8 to 10 other children, J.

was probably not accustomed to individual attention. Consequently, she was highly motivated to please her tutors and was always a well-behaved, pleasant little girl.

Adaptive self-care abilities were present at a relatively high level in J. Her eating skills were very developed. She was also thoroughly toilet-trained and could take basic are of washing herself and combing her hair. Her dressing skills were a bit lower because of her spasticity, but she was able to put on her coat and also hang it up. Although J. could take care of herself adequately, she would often let others carry out small tasks for her, such as helping her with her coat or pushing her wheelchair. This was probably evidence of her dependency on social interaction. Possibly, she adopted a dependent role as a device to prolong interaction with others.

J.'s intellectual ability was assessed by the experimenter at the termination of the program upon special request by her teachers. The Standford-Binet (Form L-M) appeared to be the best suited standardized intelligence test for J.'s needs. The lack of time limits for most of the performance items would allow most tests to be within J.'s ability, for she was able to manipulate her right arm and hand adequately. The results of this test showed J. to have an IQ of 57, that is borderline between the trainable and educable levels of mental retardation. Since J.'s language and social-adaptive behaviors were fairly well developed, and since she was able to learn some basic academic skills she appeared to fall in the educable category. It was the opinion of the experimenter that the

IQ score was an underestimate of J.'s actual potential. Her physical handicap, coupled with a milieu of almost totally mentally and physically handicapped children (both at home and at school) probably limited J.'s experience enough to lower her score on a standardized IQ test.

Program. Since J. did appear reasonably able to care for herself within the limits of her disability and because specific skills were not mentioned on the pre-program questionnaire, it was decided to concentrate on some very basic academic skills suggested by her teacher. These included: (a) recognizing the capital letters of the alphabet ("What letter is this?"), (b) recognizing the small letters of the alphabet ("What letter is this?"), (c) recognizing the numerals 1-20 ("What number is this?"), and (d) telling time ("What time is it?"). (See Appendix O for J.'s program in detail.)

Materials. The materials and apparatus used in J.'s tutoring program were:

1. Small pieces of graham crackers and 2% milk - used as primary reinforcement for correct responses.
2. Glass and dish - used for handling of primary reinforcement.
3. Tissue paper - standard equipment.
4. Twenty-six, 3 1/2 in. squares of green cardboard on which were printed the capital letters of the alphabet on one side and the corresponding small letters on the other side, used in the exercises concerned with identifying the letters.
5. Twenty, 3 1/2 in. squares of red cardboard on which were printed the numerals 1-20, used in the counting activities.

6. A red, rectangular (10 in. x 11 in.) piece of cardboard on which was printed the face of a clock with movable hour and minute hands, used in the telling time tasks. On a few occasions a real alarm clock was used in these activities.

Number[3] of Correct and Incorrect Responses Per Tutoring Session for Tutee J. Figure 26 indicated that J. already had obtained some degree of competence in the target skill comprising her program. There was, however, a slightly higher number of incorrect responding during the B1 phase as opposed to the other experimental periods in the program.

When both primary and secondary reinforcement were introduced into the T1 phase, there was a decrease both in the number of correct responses and in the number of incorrect responses. After this initial decrement, the number of correct responses increased to the previous high level, and the number of incorrect responses continued at a very low level. Although there were a few variations, this pattern continued throughout the duration of the program regardless of any changes that were made in the experimental conditions.

It appeared from Figure 26 that J. already exhibited a fair degree of competence in her program. The main indication of improvement on this graph was a reduction in the number of incorrect

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[3]The capital and small letters of the alphabet and the numerals from 1 to 20 were presented to J. in groups of 3 and 4, respectively. J. had to identify each member of an entire group before a correct response was scored.

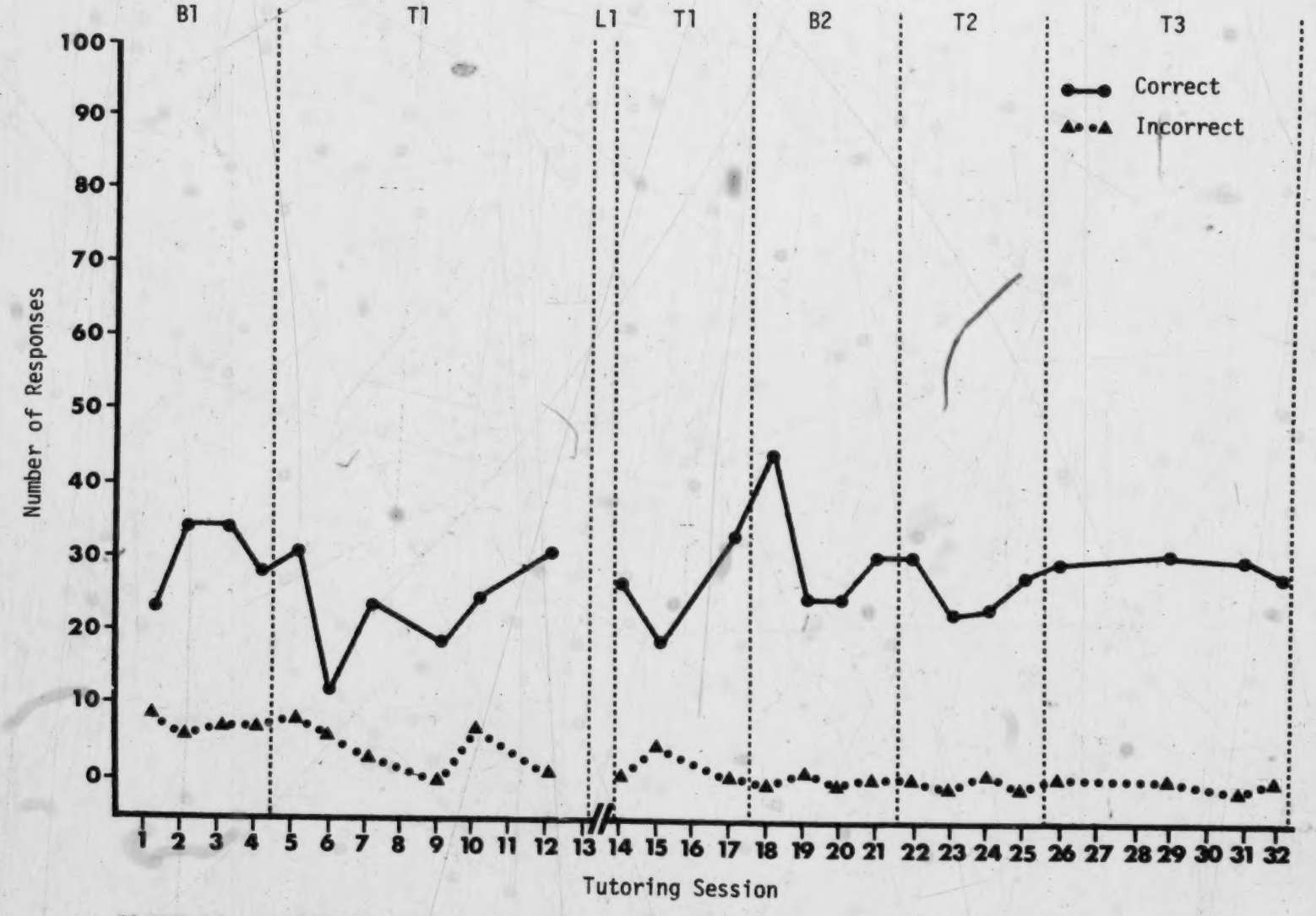

FIGURE 26. NUMBER OF CORRECT AND INCORRECT RESPONSES PER TUTORING SESSION. (TUTEE J.)

responses. No relevant evidence was obtained as to the effectiveness of the behavior modification tutoring program.

Percentage Correct Responses Per Tutoring Session for Tutee J. Figure 27 likewise indicated that J., previous to tutoring, had achieved a considerable degree of competence in the various target behaviors adopted for her program. However, an improvement in the percentage of correct responses was noted throughout the program. A general upward trend was seen during the T1 phase. At the beginning of the B2 period, the fluctuations in the percentage correct occurred less often and with less magnitude. The reliability of obtaining a correct response was increased over the B1 and T1 phases.

It appeared, therefore, that J. did improve as was evidenced by increasingly and consistently higher percentages correct. However, this improvement cannot be correlated with the use of behavior modification techniques, for there was no significant change in J.'s behavior patterns (as indicated by the percentages correct) when reinforcements were withheld during the B2 and T2 phases.

Cumulative Number of Correct and Incorrect Responses Per Tutoring Session for Tutee J. Figure 28 also presented a picture of general improvement for Tutee J. The cumulative number of correct responses was consistently higher than the cumulative number of incorrect responses throughout the tutoring program. In fact, there appeared to be a substantial difference between cumulative number correct and cumulative number of incorrect upon termination of the tutoring project.

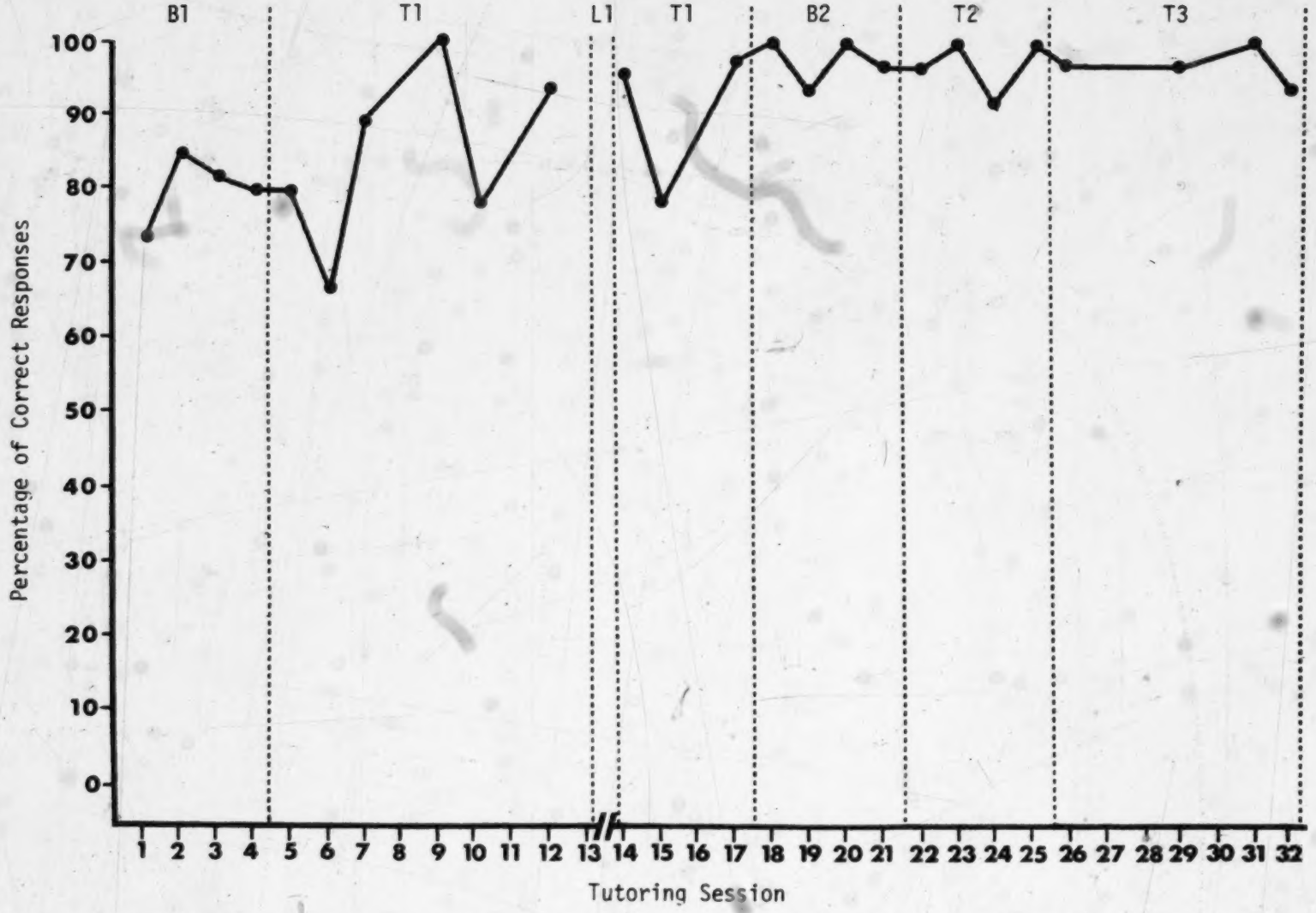

FIGURE 27. PERCENTAGES OF CORRECT RESPONSES PER TUTORING SESSION. (TUTEE J.)

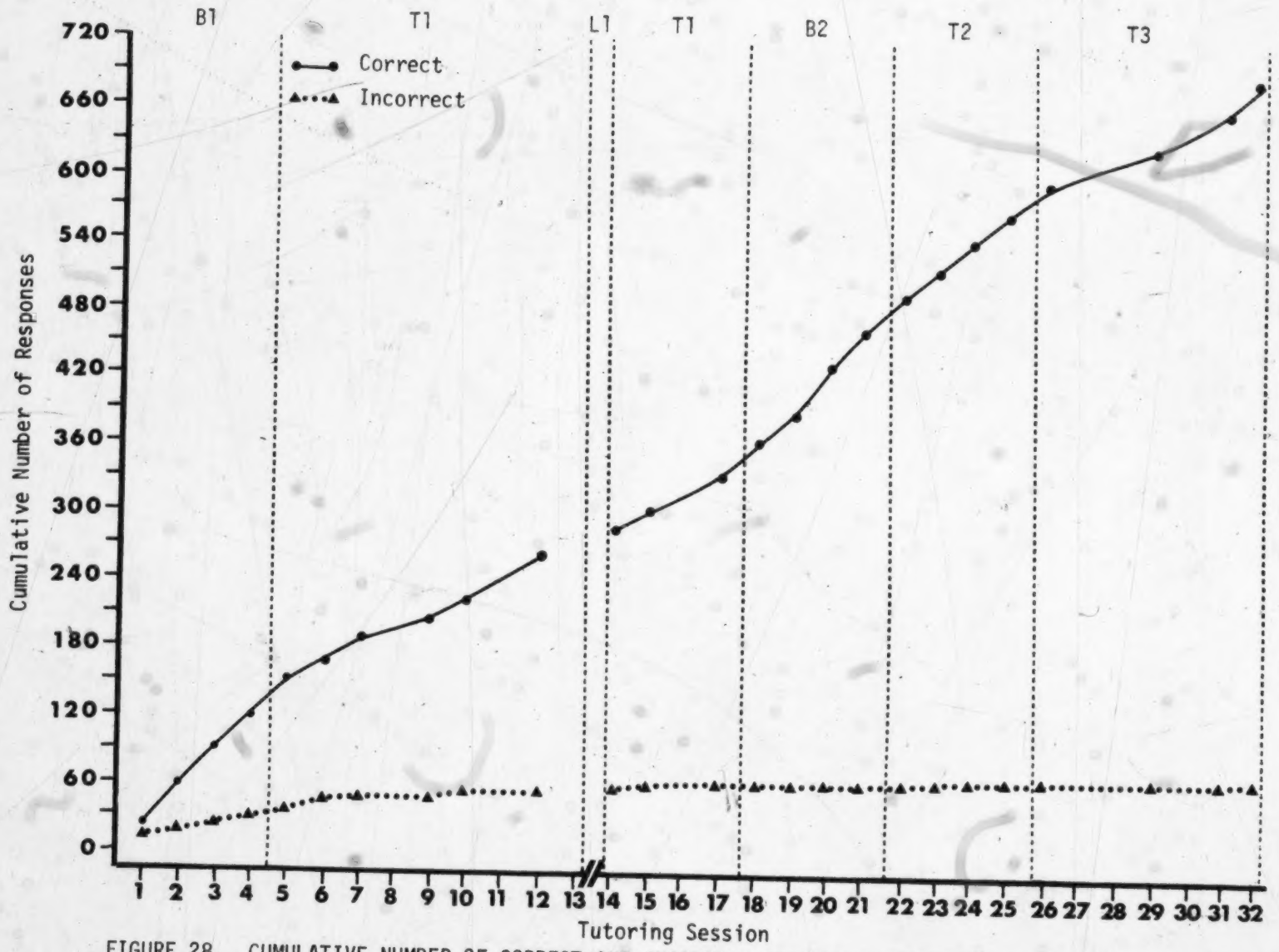

FIGURE 28. CUMULATIVE NUMBER OF CORRECT AND INCORRECT RESPONSES PER TUTORING SESSION. (TUTEE J.)

During the B1 phase both the rate of correct responding and the rate of incorrect responding increased, although a higher rate of correct responding was noted. During the T1 phase the rate of incorrect responding levelled at a near-zero rate, while the rate of correct responding continued to climb. This pattern was maintained for the duration of the program.

Figure 28 indicated, therefore, that there was improvement on the various tasks included as part of J.'s program as depicted in the increasing rate of correct responding and the near-zero rate of incorrect responding. No evidence was observed to indicate that the behavior modification techniques played an important role in the control of J.'s behavior. Rates of correct and incorrect responding appeared to remain relatively stable regardless of the experimental conditions in effect.

Weighted Percentages[4] Correct Per Week for Tutee J. The weighted percentages correct for each target skill comprising J.'s program follows:

1. "What letter is this (capitals)?" Figure 29 indicated that J. was already fairly accurate in this skill with a baseline weighted percentage correct of 70%. There was, however, a steady increase in the weighted percentage correct during the program. The tutoring

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[4]Since J. was fairly advanced in all of the target skills comprising her program, a correct response was only scored when the desired response was obtained the first time it was requested. Thus, she was required to answer at the level of the final goal behavior to reach criteria. All the percentages, therefore, are weighted at substep 5 which was the final substep for all the target skills.

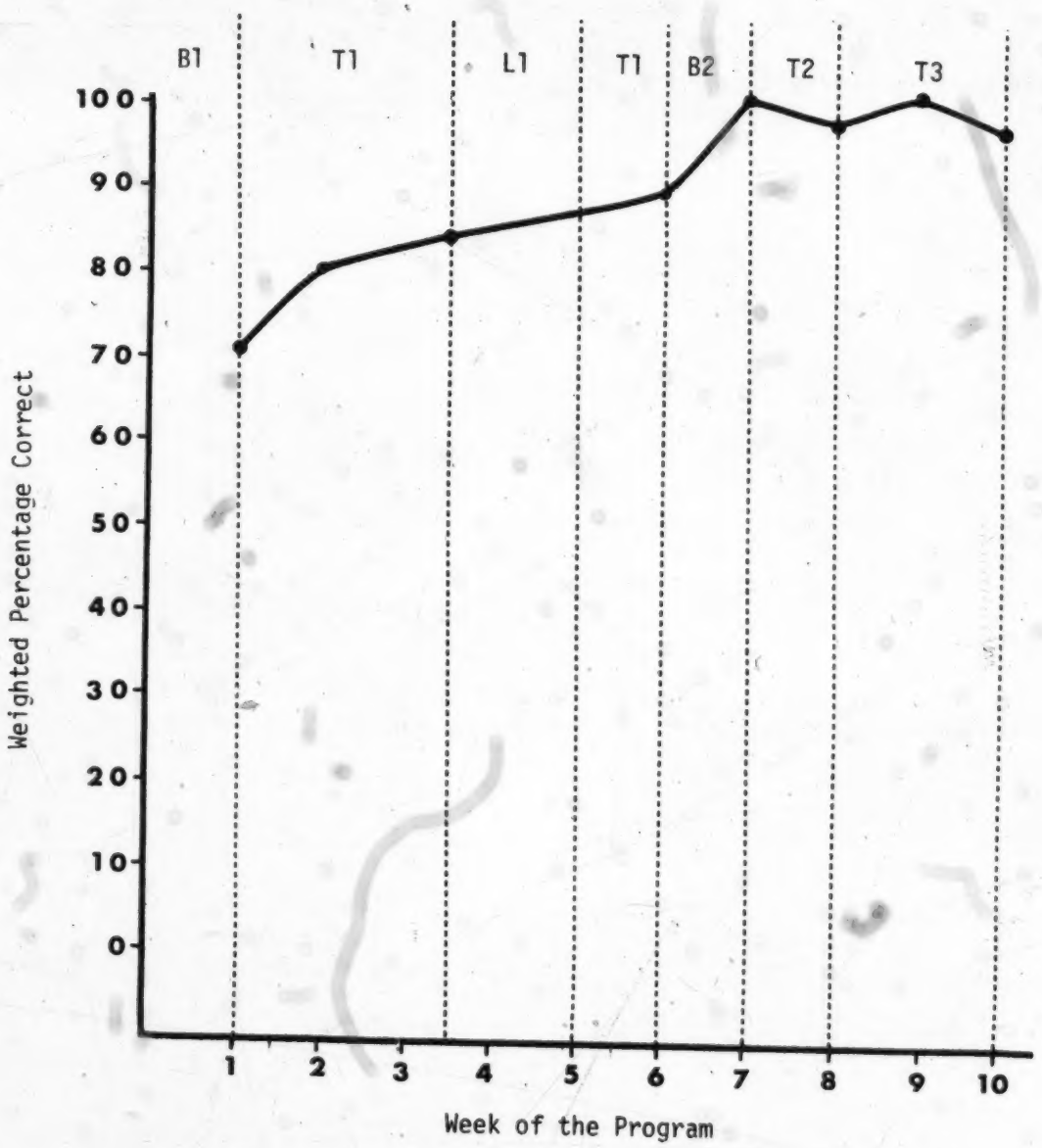

FIGURE 29. WEIGHTED PERCENTAGES CORRECT. TARGET SKILL "WHAT LETTER IS THIS (CAPITALS)?" (TUTEE J.)

program, therefore, appeared to be beneficial to J. in some way. No evidence was available indicating the effectiveness of the behavior modification techniques, for there were no marked changes in J.'s behavior on this target skill when reinforcements were withheld (See Table R-15, Appendix R).

2. "What letter is this (small)?" Improvements on this target skill were more marked, probably because J. had less initial competence with lower-case letters than with upper-case letters. From a level of about 56% correct during the B1 phase, J. increased to a level of about 85% correct during the T1 phase (See Figure 30). This was followed by a levelling period until the end of the T1 phase when J. improved steadily for the rest of the program eventually reaching 100% (See Table R-16, Appendix R). Again there was no evidence that the reinforcement techniques were responsible for this improvement.

3. "What number is this?" There were more fluctuations in the percentage correct for this target skill as seen in Figure 31. The high B1 percentage correct was followed by a sharp decrease during week 1 of the T1 period. However, a very high level in the percentages correct was maintained throughout the duration of the T1, B2, and T2 phases. There was another decrease in the percentage correct during the T3 phase, when only a few tutoring sessions were spent on this skill (See Table R-17, Appendix R). Although there were some fluctuations in her performance, J. appeared to be functioning at a higher level than was observed during the baseline period. The reinforcement techniques did not produce any

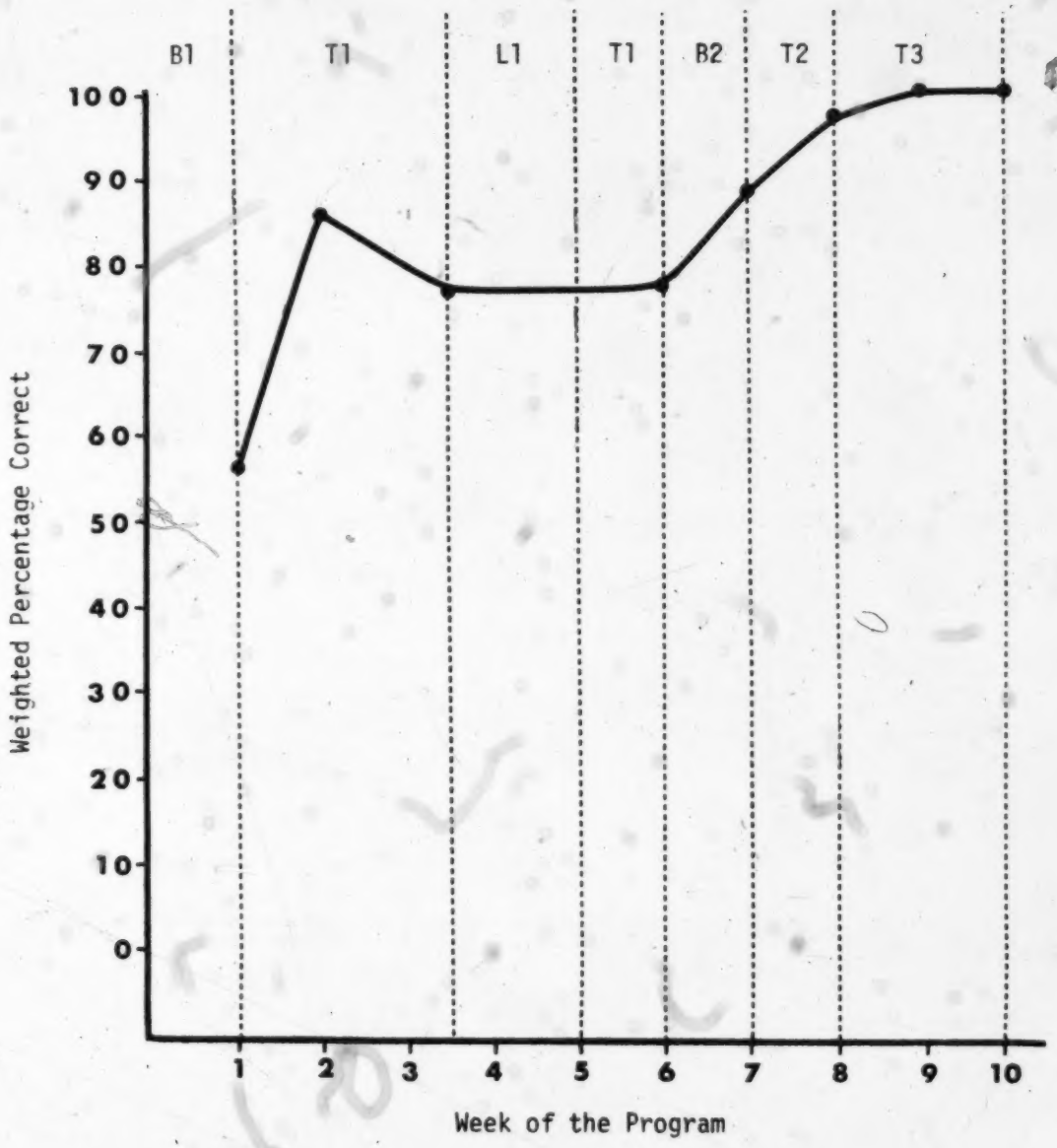

FIGURE 30. WEIGHTED PERCENTAGES CORRECT. TARGET SKILL "WHAT LETTER IS THIS (SMALL)?" (TUTEE J.)

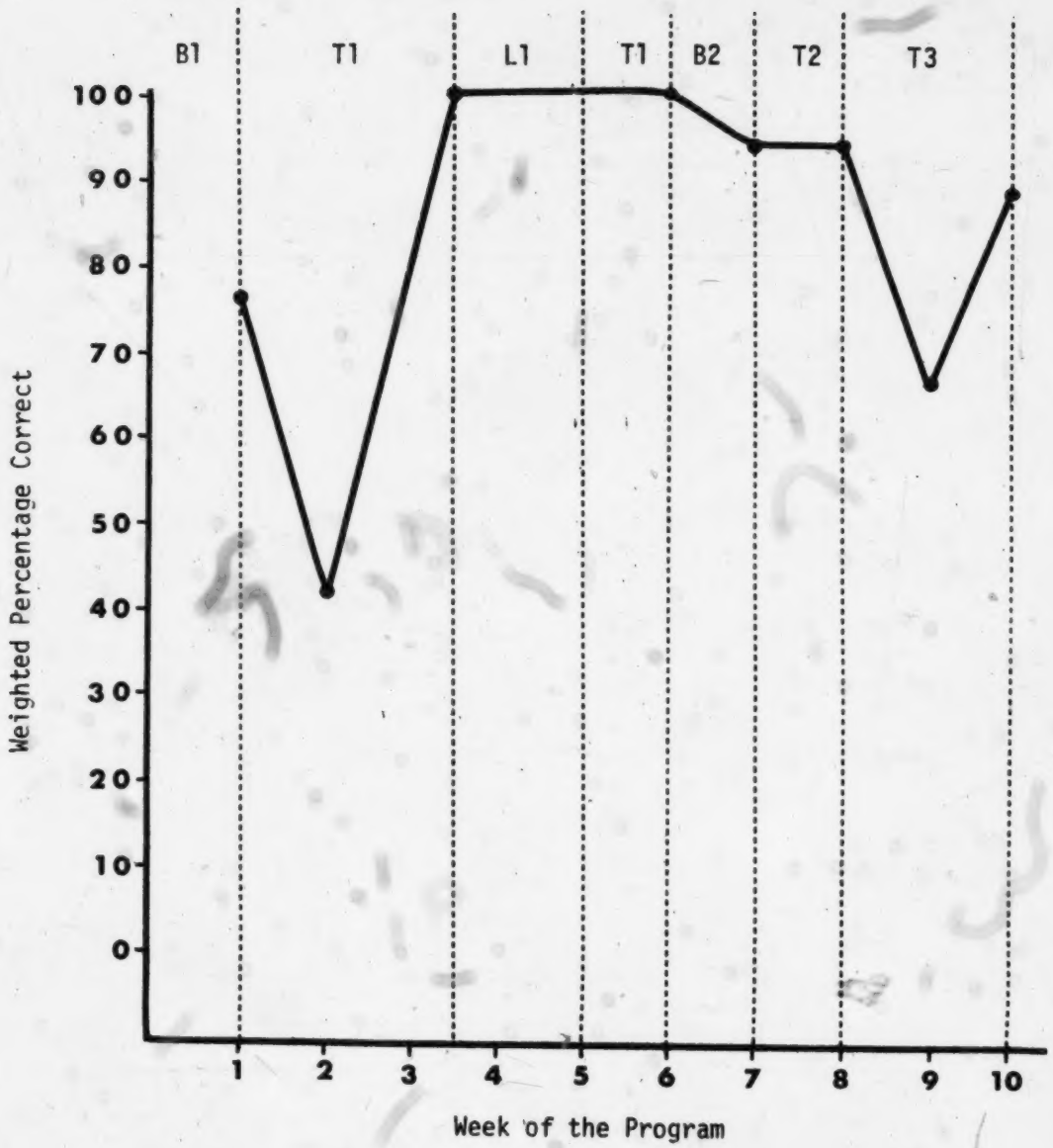

FIGURE 31. WEIGHTED PERCENTAGES CORRECT. TARGET SKILL "WHAT NUMBER IS THIS?" (TUTEE J.)

differential results in performance on this target skill.

4. "What time is it?" Figure 32 indicated that J. already had this skill adequately as indicated by the percentage of correct responses (See Table R-18, Appendix R). Since it already existed at such a high level of percentage correct, improvement was impossible to determine. It was possible that J. was only cueing on the numbers to recognize the time and had no real conception of time. The effectiveness of the behavior modification techniques was also inconclusive since there was no change in J.'s behavior on this target skill when the experimental conditions were altered.

A general pattern of advancement was noted in the target skills comprising J.'s program, although many of the skills were a part of her behavioral repertoire. The greatest amount of improvement was observed in identifying correctly the capital and small letters of the alphabet. Although there were many fluctuations in her performance, J.'s ability to recognize the numerals from 1 to 20 increased. Telling time already existed at a high degree of competence in Tutee J., so improvement was not observed.

For all four of the target skills comprising J.'s program there was no evidence that her progression was due to the behavior modification techniques as indicated by the weighted percentage correct for each target skill. In each instance there was no change in J.'s behavior when reinforcements were withheld. It appeared that some other motivating factor was effecting J.'s progress.

Progress Tests for Tutee J. The data of the progress tests presented a more global picture of J.'s advancement through her program

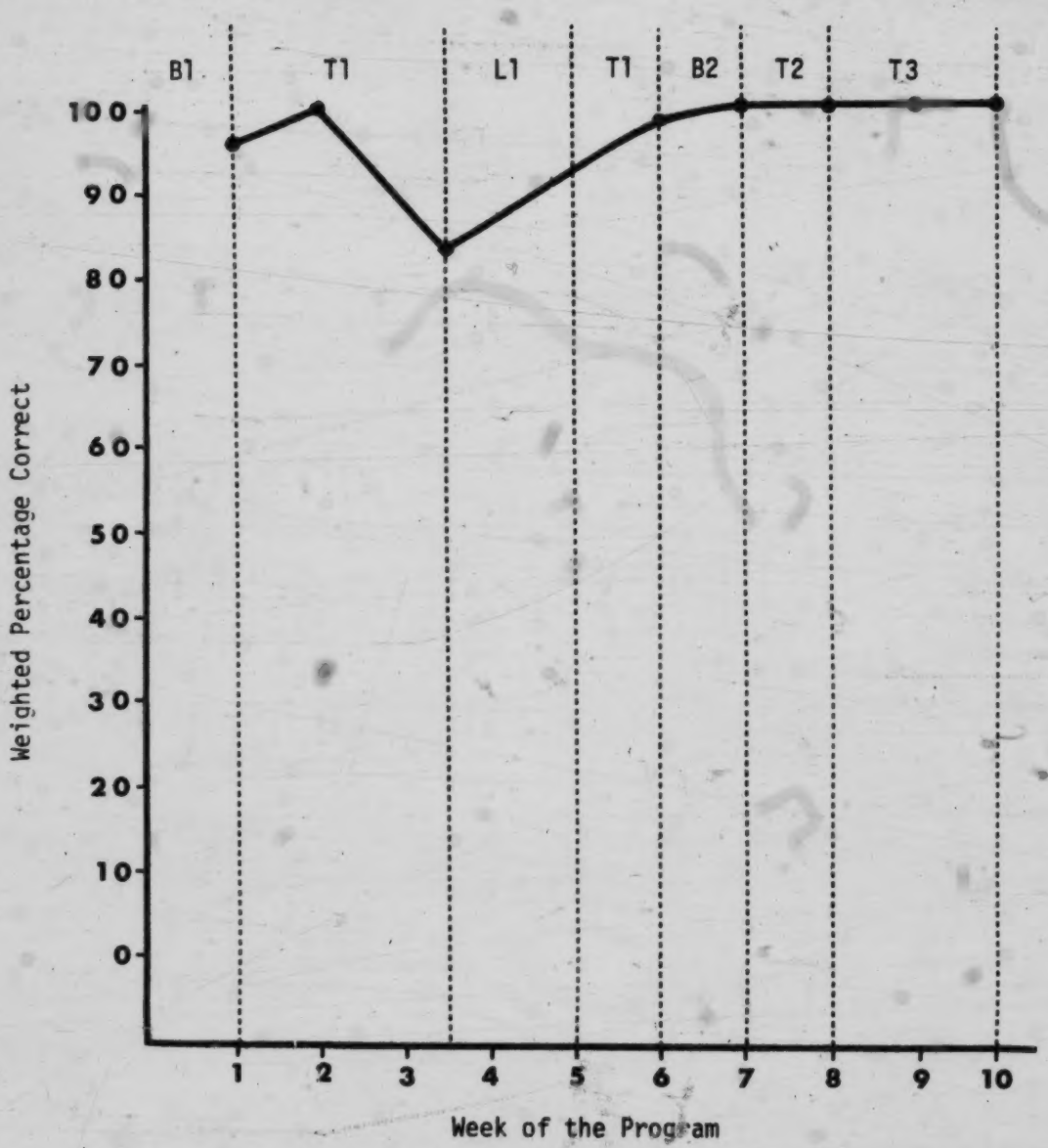

FIGURE 32. WEIGHTED PERCENTAGES CORRECT. TARGET SKILL "WHAT TIME IS IT?" (TUTEE J.)

(See Figure 33). During the B1 phase none of J.'s target behaviors were classified as learned skills. By the beginning of Easter break during the T1 phase all four of the skills on J.'s program were classified as learned. After the L1 phase J. appeared to have lost 2 of the 4 skills, but they were quickly regained during the remainder of the T1 phase.

When both primary and secondary reinforcements were withheld, J.'s performance decreased to near baseline level with only one skill being classified as learned. However, when social rewards were reinstated, J.'s performance immediately increased to her previous level. There also was a decrease in the number of skills classified as learned after the L2 phase.

It appeared from Figure 33, therefore, that a combination of practice and social reinforcement were important to J.'s improvement. The effect of practicing the various skills was seen in the decrease in performance after a latency period. Although the effects of social reinforcement did not appear to be evident on the graphs obtained from the daily observation records, they did appear when a more global measure, such as the progress tests, were used.

Summary of Results for Tutee J. Even though some of the target skills were in J.'s behavioral repertoire, the data seem to depict a general picture of improvement. Figure 26, representing the number of correct and incorrect responses, indicated that there was a reduction in the number of incorrect responses throughout the program. Likewise, the percentage of correct responses continued to increase, with fluctuations occurring less often and with less

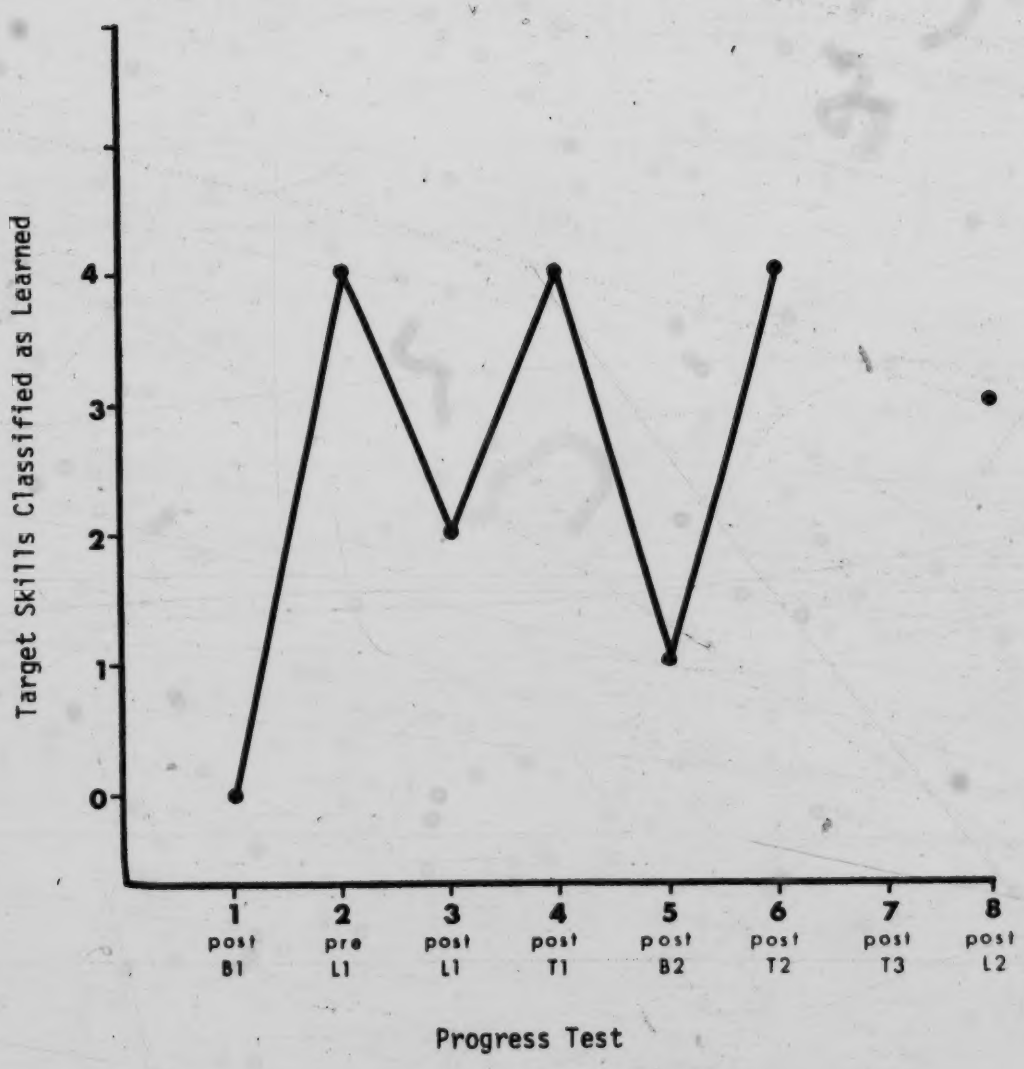

FIGURE 33. RESULTS OF PROGRESS TESTS. (TUTEE J.)

magnitude. From Figure 28, it appeared that the rate of correct responding was significantly higher than the rate of incorrect responding as represented by the cumulative number of correct and incorrect responses.

The weighted percentages correct (Figures 29, 30, 31, 32) indicated varying degrees of progress for Tutee J. The greatest amount of advancement was noted in the identifying of the small and capital letters of the alphabet. The skill of recognizing the numerals from 1 to 20 showed some progress even though many fluctuations were noted. Telling time appeared to already be a part of J.'s repertoire, and, consequently, maintained a high stable level. However, the experimenter felt that J. was simply recognizing the printed numerals on the clock, as opposed to understanding the concept of time.

The progress tests as administered to J. also presented a general picture of improvement. J. did show an increase in the number of skills classified as learned during the program. However, there were temporary decreases after each latency period indicating that the actual drill and practice in the various skills was important for J.'s performance. There was also a decrease in the number of skills classified as learned during the B2 phase when no reinforcements were given for correct responses. The number of skills learned returned to its previous level when social reinforcement was reinstated.

The decrease in the number of skills learned, as measured on the progress tests during the no-reinforcement period, were the only indications that the behavior modification techniques were effective

in controlling J.'s behavior. All the other forms of data presentation indicated no change in J.'s behavior when the experimental conditions varied. It appeared, therefore, that J. was motivated by more than the reinforcements used in the present study, although there was some indication that social rewards did play a part in her improvement. From the data and J.'s observed behavior it seemed that J.'s continued improvement was due in part to the actual practice of the skill and the one-to-one teaching arrangement. It seemed possible that J. was in some way instrinsically reinforced for learning the skills in her program. Since J. was eager to socialize the mere participation in the tutoring program could have been sufficient to maintain motivation.

The post-program questionnaire completed by J.'s parent also indicated some advancement during the tutoring project. Although no specific target skill showed improvement at home, J.'s foster mother reported that there was progress in school work. She also stated that J. appeared to benefit emotionally from the tutoring program in that she was more self-assured.

Case Study 5: L.

L. was a 7 yr. 6 mos. old girl at the beginning of the program. She weighed 43 1/2 lbs., and stood 3 ft. 3 1/2 in. tall. She was diagnosed as having spastic cerebral palsy; and, although all four of her limbs were involved, her legs were the most affected. She could scoot herself along the floor, and was learning to walk with the aid of braces and crutches. Her main method of locomotion while

attending the tutoring sessions was by means of a small low chair with large wheels.

Due to her phsyical handicap L. was not observed in very many physical activities. However, she appeared fairly strong as was evidenced by her ability to lift herself out of her chair and to support her weight on crutches. Because of her handicap L.'s fine motor dexterity was also lower than could be expected for a normal 7 yr. old (Espenchade & Eckert, 1967).

Receptive language in L. existed at a relatively high level. She seemed at all times aware of her environment and what was expected of her. Although it was reported that L. had a considerable expressive language at home, speech was practically non-existent at school. In the classroom L. would sometimes use a loud whisper to voice her wants. However, even this behavior was not observed during the tutoring sessions. The only verbal attempts noted were lip movements in response to some question, or request to imitate. During the tutoring sessions there was no spontaneous vocalizations made by L. Any sort of attempt to talk or whisper usually had to be elicited with much prompting. L.'s teacher reported, however, that L. could use speech in meaningful ways, and by the end of the school term L.'s teacher stated that she had managed to elicit some meaningful speech from L.

L. seemed to enjoy other children, but would never actively join in their activities. She always would watch and laugh from the sidelines, but make no attempt to join into any game. A psychological report in June, 1971, stated that L. displayed some signs of

negativism during the assessment. There did appear to be some evidence for this statement in that L. seemed sometimes more motivated by negative attention than by positive.

Although L. was capable of many activities she would often feign helplessness to gain attention. For instance, she would often wheel her chair into a wall, remaining there as long as she had an audience. When this behavior was ignored she would back out her chair and continue with other activities. L. would also take as much time as possible to eat her lunch. Attempts to apply positive reinforcement did not seem to affect this behavior, nor did any other type of technique, such as removing her from the table or removing her lunch. It appeared from many of L.'s behaviors, that she lacked social maturity. She was, however, cooperative throughout the tutoring sessions.

In adaptive behaviors, as compared with other children in the school, L. was fairly well advanced. She was quite adept at moving herself; and, although extremely slow, she was capable of supporting herself and walking on crutches. She was totally toilet-trained, and could also manipulate her lunch adequately. She also appeared to have some dressing skills, but she had difficulty in tasks requiring fine motor ability.

L.'s intellectual ability was assessed in June, 1971. However, the assessment was inconclusive due to L.'s refusal to answer and negativistic behavior. She was tentatively placed in the moderate range of mental retardation. This classification did seem to best describe L.'s functioning in terms of socio-emotional and intellectual

behavior. However, if the claim that she possessed considerable language competence were to be accepted (not exhibited at school), the categorization of "trainable" could have been an underestimation of L.'s potential.

Program. In light of L.'s ability and after consulting the pre-program questionnaire answered by her parents, it was decided that L.'s program should concentrate on dressing skills with an emphasis on fine motor tasks, and also on vocal verbal behaviors. The skill of paying attention was added because L. often would look away from the person addressing her. Therefore, the target behaviors included as part of L.'s program were (a) paying attention ("Look at me."), (b) putting on her sweater ("Put your sweater on."), (c) unbuttoning ("Unbutton your sweater."), (d) buttoning ("Button your sweater."), and (e) vocal verbal behaviors ("Speak louder."). (See Appendix P for L.'s entire program in detail.)

Materials. The apparatus and materials used in L.'s tutoring program consisted of:

1. Smarties - small candies used as primary reinforcement for correct responses.
2. Tissue paper - standard equipment.
3. Sweater - a pullover type (belonging to Tutee C.), used in teaching L. to put on her sweater.
4. Sweater with buttons - a sweater with somewhat larger buttons and buttonholes used in the unbuttoning and buttoning exercises (obtained from school's lost and found).

5. Cassette tape recorder - used in two of L.'s tutoring sessions to obtain a reliability count on her vocal verbalizations.

Number of Correct and Incorrect Responses Per Tutoring Session for Tutee L. Figure 34 presented a general impression of constant flux between the number of correct responses and the number of incorrect responses. No clear trends were indicated on this data presentation. It did appear, however, that for the most part the number of correct responses remained higher than the number of incorrect responses.

Due to the fact that the tutors only emphasized the target skill "Look at me" during the B1 phase, the number of correct responses was quite high. When other more difficult behaviors were tutored during the T1 phase, L.'s performance was lowered and was probably more representative of L.'s ability. There was, however, much fluctuation between the number of correct responses and incorrect responses. During the return to baseline conditions the response pattern changed in that the number of correct responses became slightly lower with fewer day-to-day fluctuations. The same pattern was noted for the number of incorrect responses. It was during that T2 and T3 phases that the number of incorrect responses became very low (near zero) and stable. Likewise, the number of correct responses became relatively high with only a few variations.

It appeared, therefore, that there was some improvement in L.'s performance in terms of the number correct. This improvement

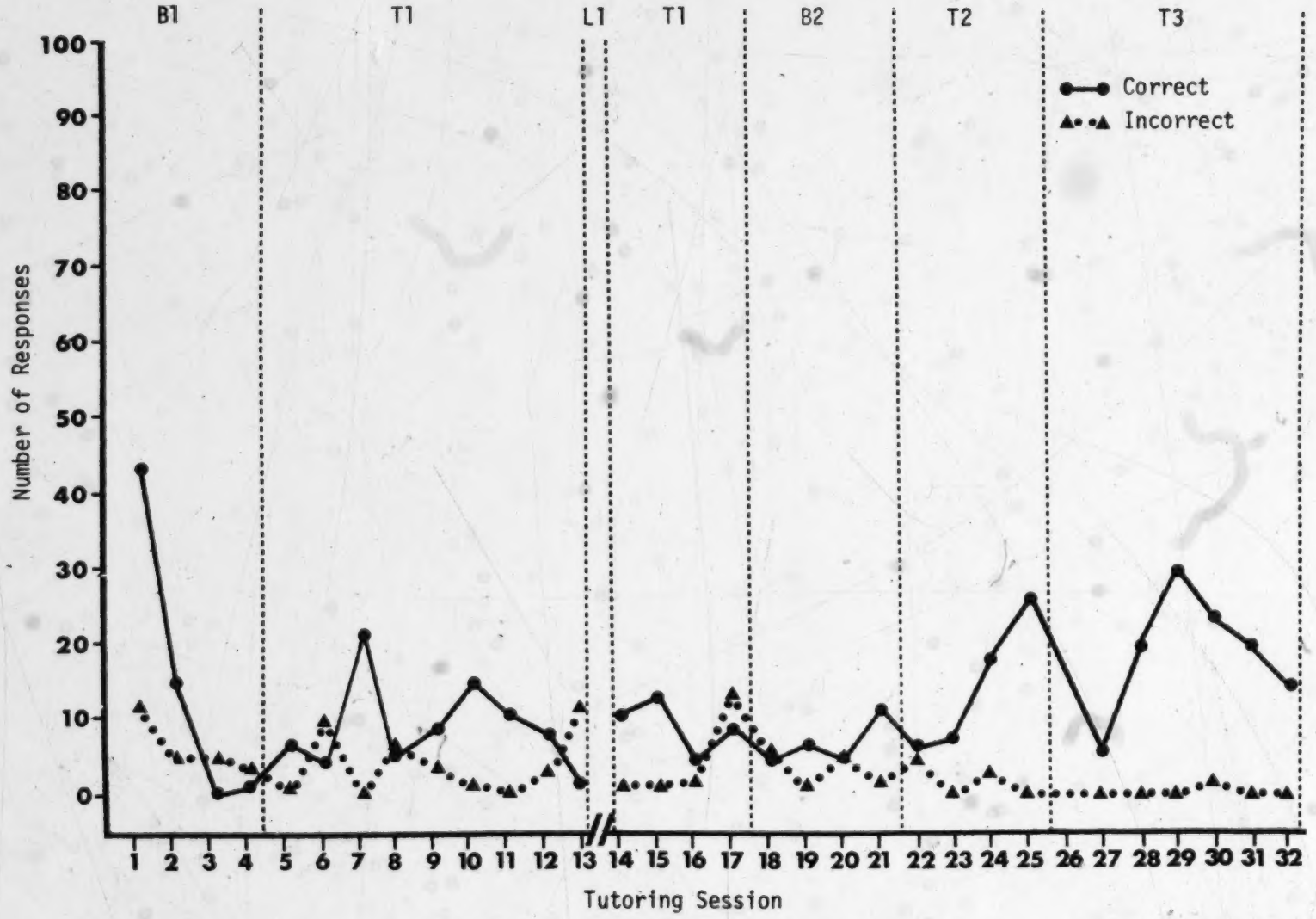

FIGURE 34. NUMBER OF CORRECT AND INCORRECT RESPONSES PER TUTORING SESSION. (TUTEE L.)

was particularly observable during the last two experimental phases (T2 and T3). During the other phases the number correct and incorrect responses were constantly varying in relation to one another, although the number of correct responses remained generally higher than the number of incorrect responses.

There appeared no concrete evidence in L.'s results as to the efficacy of the behavior modification principles used in the present study. However, there was a slight decrease of correct responses during the no-reinforcement phase and a very marked increase in L.'s performance during the T2 and T3 phases (when social rewards only, and social and food rewards, respectively, were reinstated). The lack of rewards during the B2 phase perhaps motivated improved performance on L.'s part when the rewards were reinstated. In other words, reinforcement had only a slightly motivating effect on L. before the return to baseline conditions. It could be hypothesized that when the reinforcement was removed, L. perceived that the rewards were truly under the control of the tutors. Consequently she may have been more motivated to acquire them during following sessions.

Percentage of Correct Responses Per Tutoring Session for Tutee L. Figure 35 presenting the percentage of correct responses indicated two clear trends: (a) the steady increase of the percentages correct over the duration of the program, and (b) the reduction of the magnitude of large variations in the percentages correct as the elicitation of desired responses became more and more reliable. Both these trends were indications that L. did show some progress during the tutoring program.

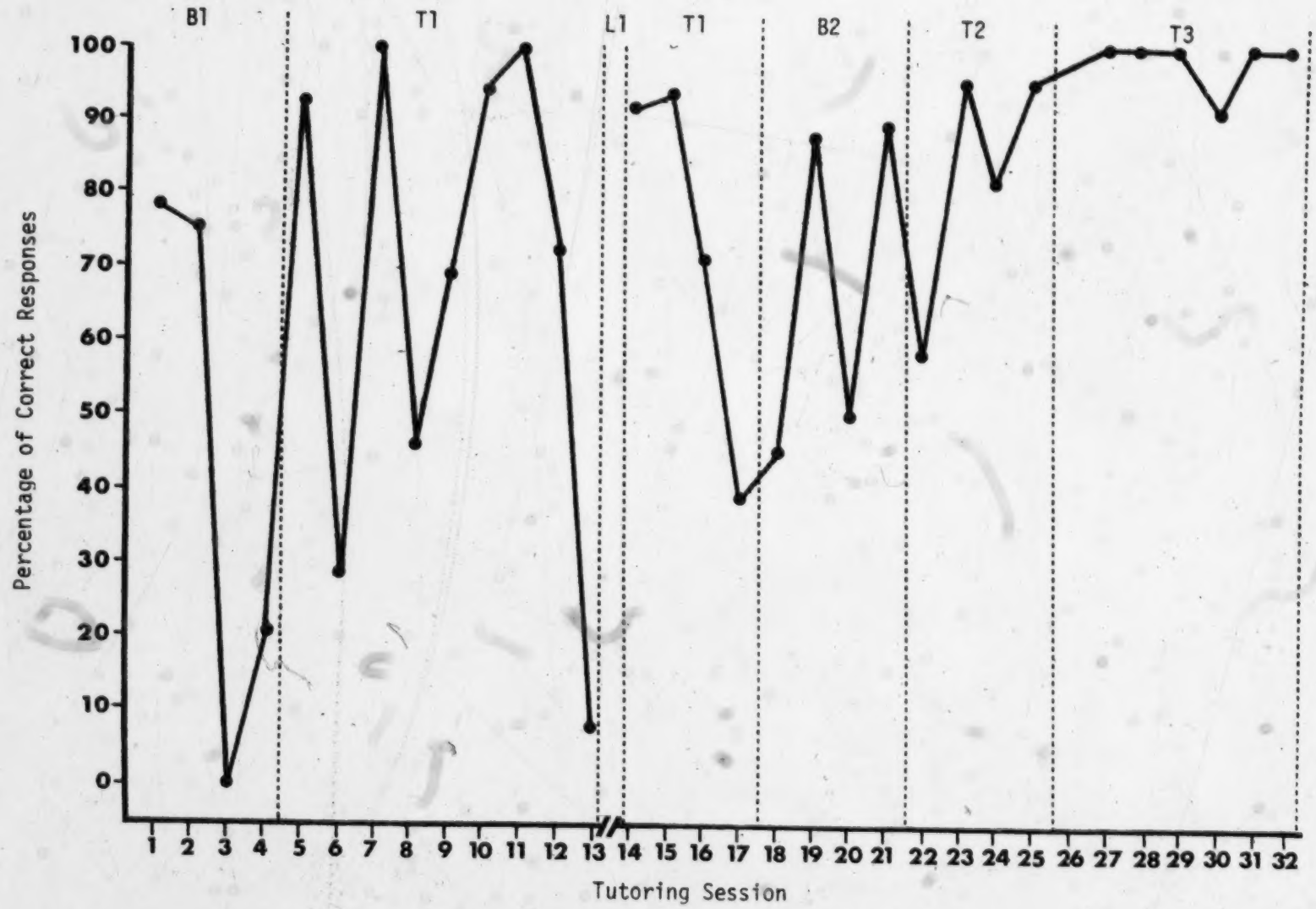

FIGURE 35. PERCENTAGE OF CORRECT RESPONSES PER TUTORING SESSION. (TUTEE L.)

A very high percentage correct on the first two days of the B1 phase was noted. This was probably again due to the emphasis placed on simple skills during this phase. The last few days of the B1 period probably more accurately described L.'s functioning. The T1 phase was marked by large fluctuations in the percentage correct. These variations became less marked during the B2 and T2 phases, until in the T3 phase there were essentially no fluctuations, with the percentage of correct responding reaching a high, stable level.

Therefore, L. did show improvement in terms of percentages of correct response. A decrement in the magnitude of variations also indicated that correct responses were being elicited more reliably. There was again no solid evidence concerning the usefulness of the reinforcement principles as a tutoring technique. However, L.'s performance did increase during the T2 and T3 phases when social and then social and primary reinforcements, respectively were reinstated, after a period of no-reinforcement.

Cumulative Number of Correct and Incorrect Responses Per Tutoring Session for Tutee L. Figure 36 depicted a general trend of improvement for Tutee L., with the rate of correct responding being consistently higher than the rate of incorrect responding. The rate of correct responding increased throughout the program while the rate of incorrect responding gradually plateaued at a near-zero level.

The lines representing both the cumulative number of correct and incorrect responses generally increased during the B1 phase. However, during T1 and B2 only the rate of correct responding

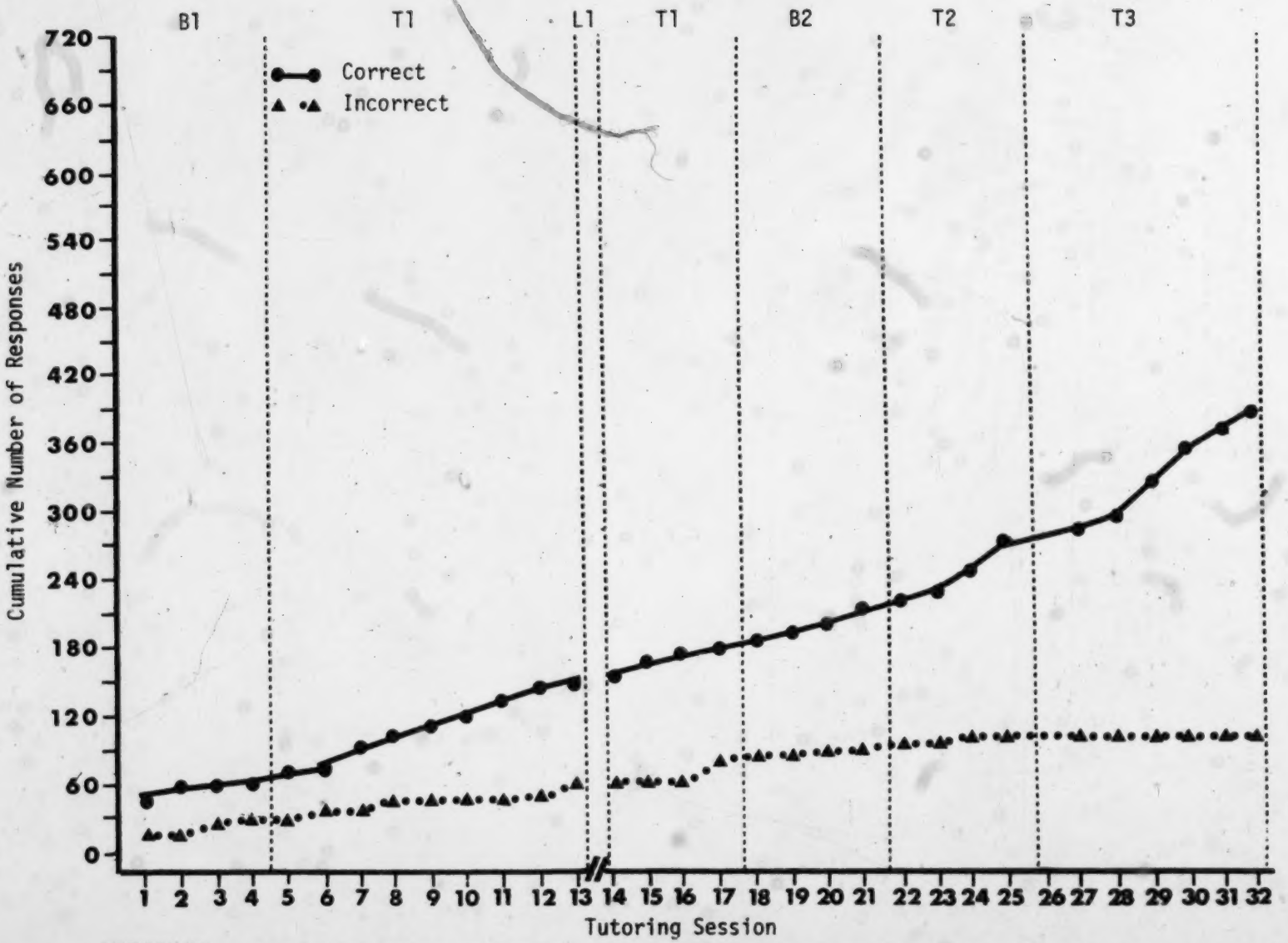

FIGURE 36. CUMULATIVE NUMBER OF CORRECT AND INCORRECT RESPONSES PER TUTORING SESSION. (TUTEE L.)

increased, while the rate of incorrect responding maintained a near-zero level. During the T2 phase there was a sharp increase in the rate of correct responding, followed by an even steeper climb in the rate of correct responding during the T3 phase. The rate of incorrect responding maintained its zero level during these two phases.

This was the only evidence on Figure 36 that the behavior modification techniques had any type of control over L.'s behavior. Although there was no decrement in performance when reinforcements were withheld from the program, a marked change in behavior was noted when social and primary rewards were reinstated. It was possible that L.'s behavior did not come under the control of the reinforcement until she realized they could be taken away.

Weighted Percentages Correct Per Week of the Program for Tutee L. The weighted percentages correct for each of the target skills in L.'s program follows:

1. "Look at me." Figure 37 indicated that this target skill was already a part of L.'s behavioral repertoire. Nevertheless, there was an improvement over the B1 period as indicated by the weighted percentages correct. In Table R-19 (Appendix R) the improvement was better indicated by advancement through the various substeps (from substep 1 to the highest substep, 6). Not enough data existed to determine the effects of the behavior modification techniques on this particular skill.

2. "Put your sweater on." Figure 38 indicated that there was an actual decrement in performance on this self-help skill. During

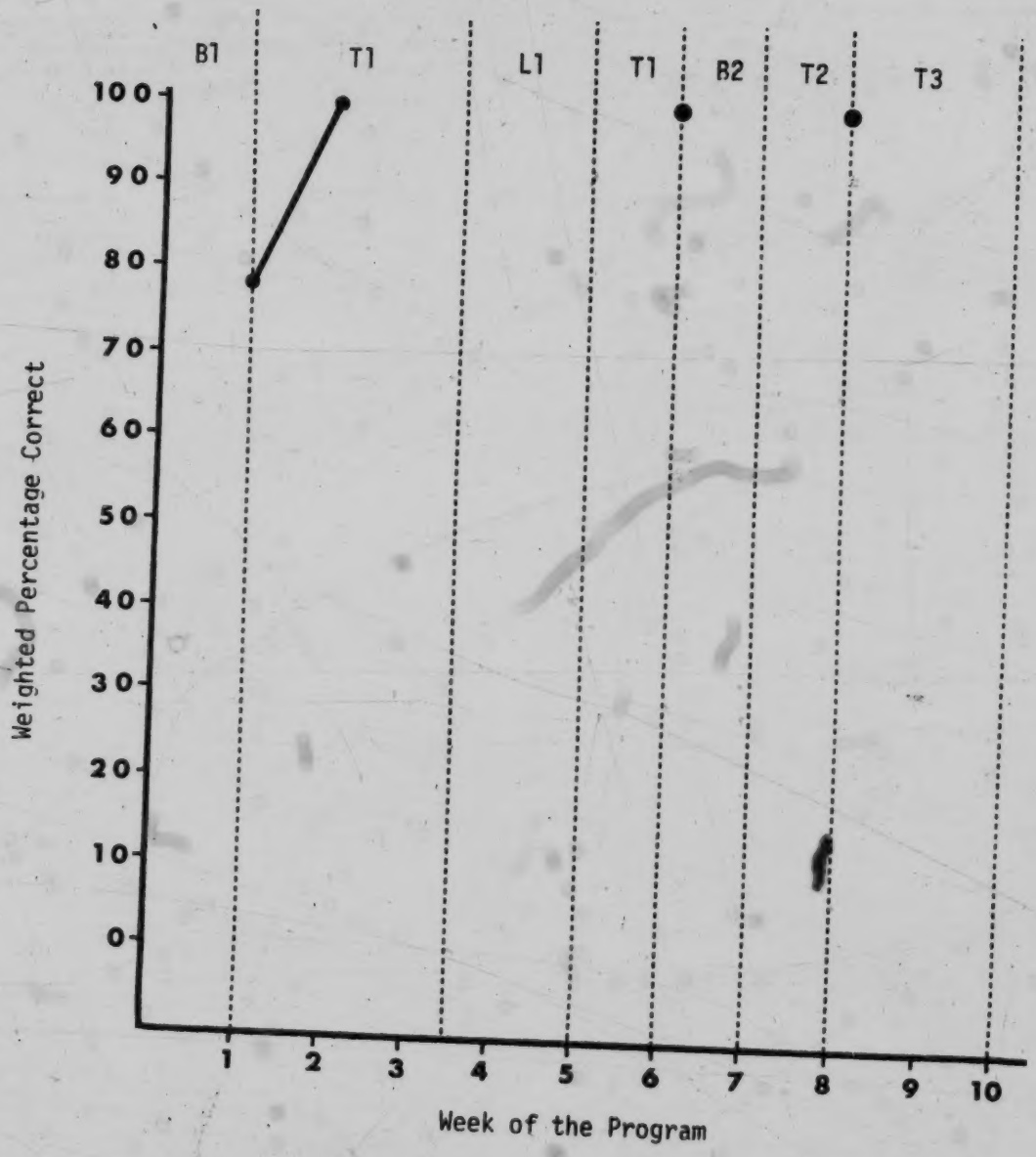

FIGURE 37. WEIGHTED PERCENTAGES CORRECT. TARGET SKILL "LOOK AT ME." (TUTEE L.)

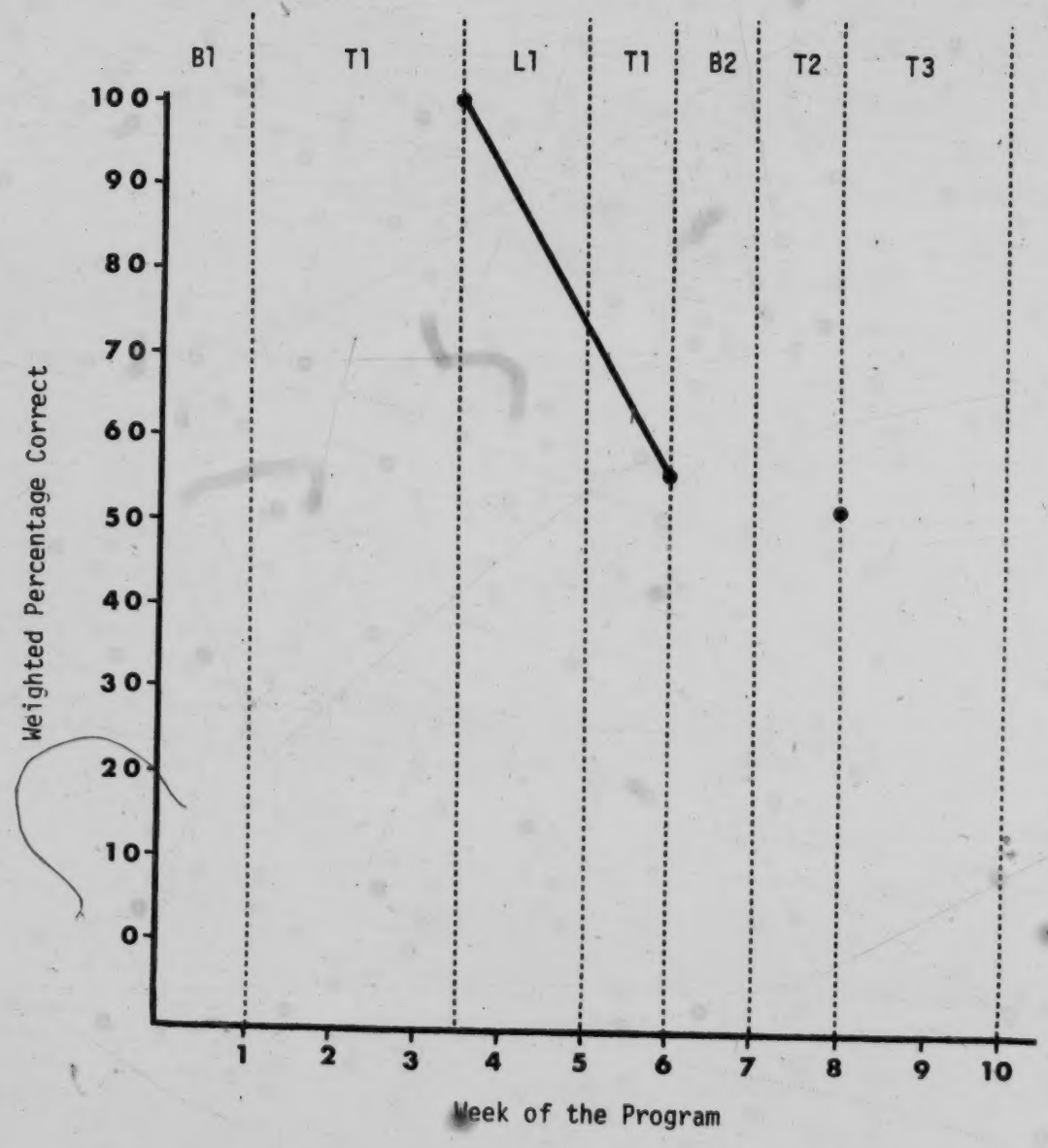

FIGURE 38. WEIGHTED PERCENTAGES CORRECT. TARGET SKILL "PUT YOUR SWEATER ON." (TUTEE L.)

week 3 1/2 a weighted percentage correct of 100% was noted for Tutee L. for substeps 1, 2, and 3, out of eight substeps (See Table R-20, Appendix R). However, during weeks 6 and 7, percentages of around 50% were recorded. This decrement in weighted percentages correct could be due to the long time delay between the weeks in which this skill was tutored. Again nothing can be said concerning the behavior modification techniques for this skill.

3. "Unbutton your sweater." Figure 39 depicted some improvement on this skill. There was a marked increase in the weighted percentages correct during the T1 phase over the B1 period. The weighted percentages correct maintained a high level for the remaining weeks in which this skill was tutored. Table R-21 (Appendix R) also showed some degree of progression through the various substeps, with substep 3 (out of 7) being reached upon termination of the project. There did not appear to be any appreciable difference in performance for this target skill during the B2 phase when no reinforcement was given for correct responses.

4. "Button your sweater." There is no figure depicting data for this target behavior because it was only emphasized during one week of the program. During this week a weighted percentage correct at substeps 1 and 2 was found to be 33% (Table R-22, Appendix R). This skill appeared very difficult for L. to accomplish, and, consequently, was not emphasized until some progress was made in the unbuttoning exercises. After attempting tutoring in buttoning during week 7, it still seemed too difficult and was not tutored for the remainder of the program.

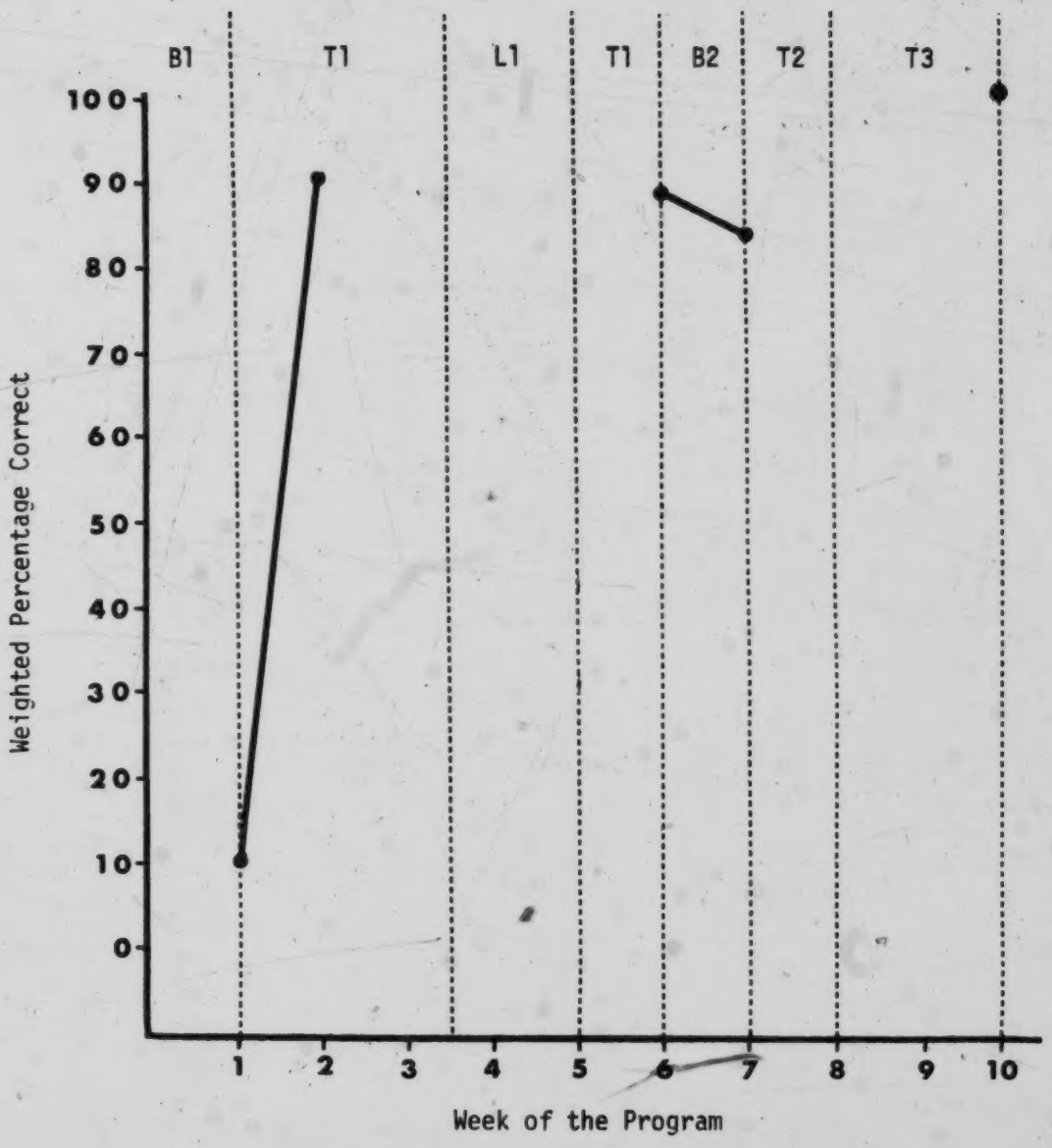

FIGURE 39. WEIGHTED PERCENTAGES CORRECT. TARGET SKILL "UNBUTTON YOUR SWEATER." (TUTEE L.)

5. "Speak louder." The target skill of obtaining vocal verbalizations did show signs of improvement as indicated by the weighted percentage correct (Figure 40). The B1 and T1 (before Easter break) phases were relatively similar in weighted percentage correct. There was a marked increase in the weighted percentages correct after the T2 phase when social reinforcement was reinstated into the program. This high level was maintained throughout the T3 phase when both types of reinforcement were used. Table R-23 (Appendix R) also indicated improvement by means of advancement through the substeps comprising her program. Again there was no concrete evidence that the behavior modification techniques were an effective tutoring method.

During the last week of the program L.'s responses were tape recorded for two tutoring sessions dealing with the target skill "Speak louder." A reliability check was taken by the experimenter to determine the reliability of the data collected by her two tutors. Out of a total of 47 responses during the two sessions, the tutor and the experimenter agreed 70.2% of the time that L.'s response could be heard.[5] The tutors, therefore were fairly reliable in the recording of responses for this target skill.

In summary, L. showed improvement in three of the target skills in her program. The first skill "Look at me," although present prior to tutoring, showed a trend toward improvement in terms of weighted percentage of correct responses. Advancement in this skill

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[5]A disagreement was scored if a response was classified (either right or wrong) differently by each recorder and/or if there was not a consensus as to whether a response actually occurred.

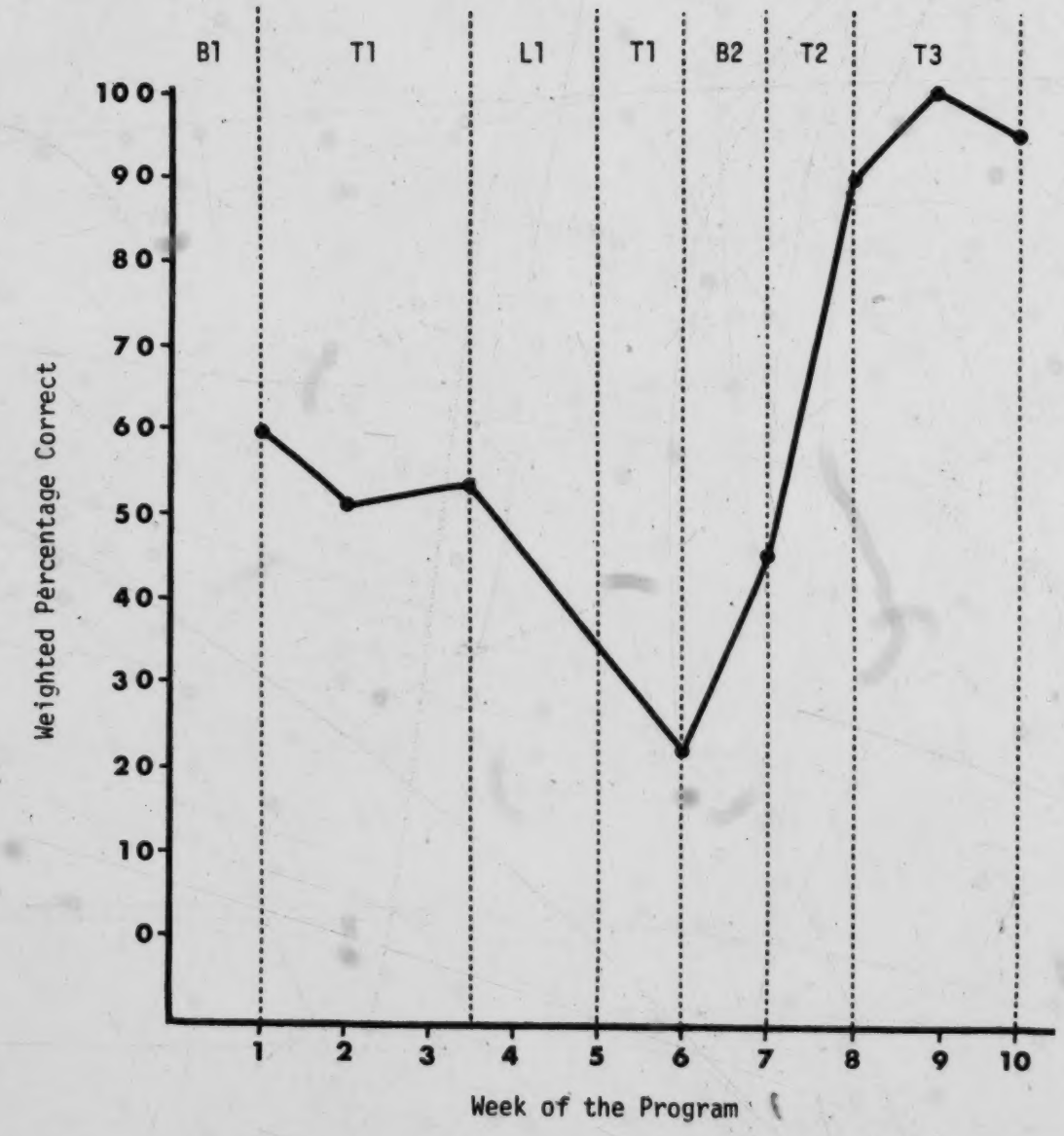

FIGURE 40. WEIGHTED PERCENTAGES CORRECT. TARGET SKILL "SPEAK LOUDER." (TUTEE L.)

was especially marked in the progression through the various substeps. A definite upward trend in the weighted percentage of correct responses was also indicated in the skill of unbuttoning. Again, there was some progression through the substeps for this behavior. The skill of verbalizing vocally showed marked improvement both in weighted percentage of correct responses and progression through substeps, during the latter part of the tutoring program.

There was no improvement noted for the skills "Put your sweater on" and "Button your sweater." In fact, the skill of putting on a sweater showed an actual decrement during the program, perhaps due to long time delays between tutoring sessions emphasizing this skill. The target skill of buttoning was found to be too difficult for L. In consequence, it was not emphasized during the tutoring sessions.

The evidence for the effectiveness of the behavior modification techniques employed in the present study was inconclusive. Certain skills were not tutored during some of the experimental conditions which makes inference difficult. In instances where data were available, there did not appear to be any decrement of correct responding during the return to baseline conditions. However, there was a marked increase in correct responding on a number of the measures when social reinforcement was reinstated, after being withheld during the B2 phase.

Progress Tests for Tutee L. Figure 41 indicated that there was no major improvement in the classification of target skills as learned. L. appeared to show fine improvements in the various skills, but was able to reach criterion on only one target skill ("Look at

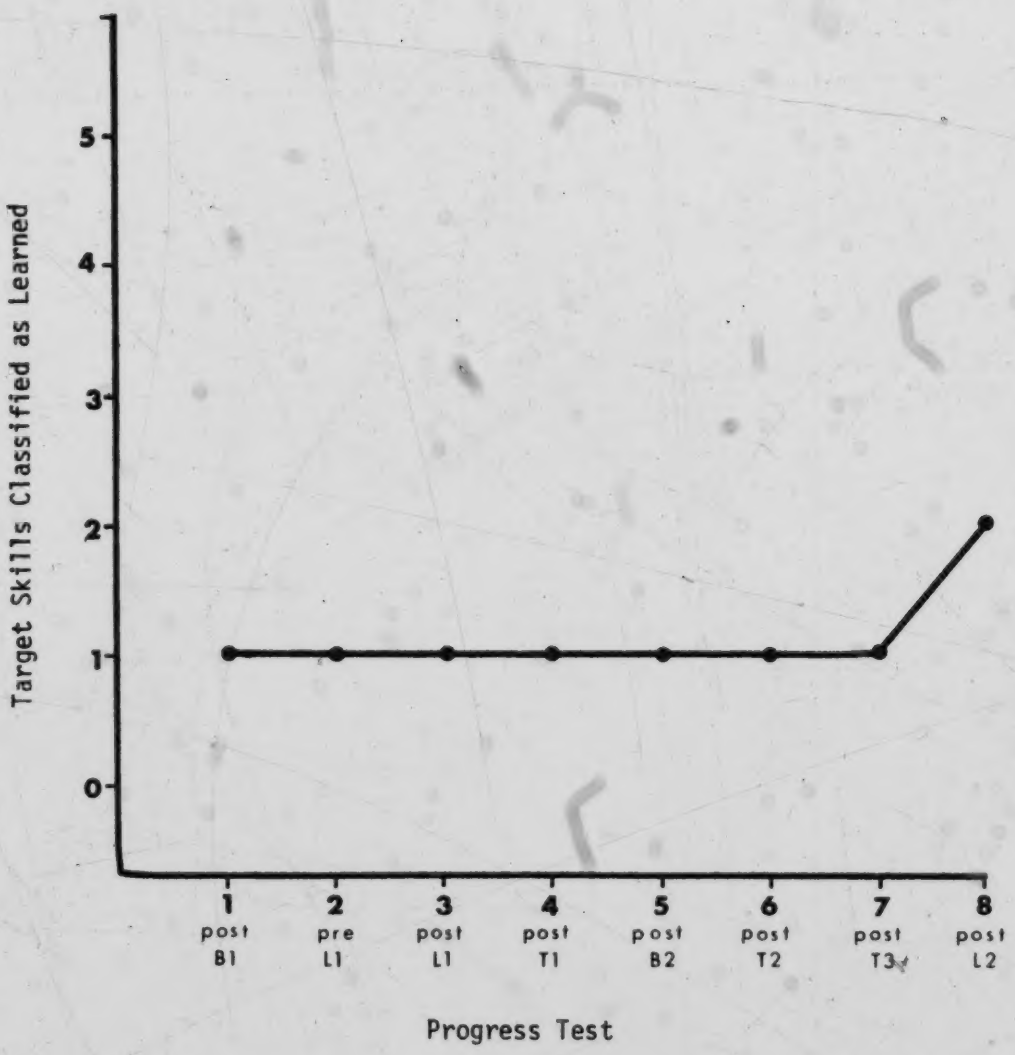

FIGURE 41. RESULTS OF PROGRESS TESTS. (TUTEE L.)

me."). There was an addition of one skill learned ("Speak louder.") after the L2 phase. The acquisition of this still was probably due to a combination of the improvement obtained during the last weeks of the tutoring program, and the fact that L.'s teacher concentrated on this behavior during the L2 phase.

Summary of Results for Tutee L. It appeared that on most measures L. did improve during the tutoring program. The number of correct responses (Figure 34) increased over the number of incorrect responses especially during the last two experimental conditions. Likewise, the percentage of correct responses (Figure 35) increased during the tutoring treatment, with fluctuations occurring less often and with less magnitude. This indicated that correct responses were being elicited on an increasingly reliable basis as the program progressed. The cumulative number of correct and incorrect responses (Figure 36) was also illustrative of improvement, with the rate of correct responding becoming relatively high, while the rate of incorrect responding approached zero.

The weighted percentages correct measure (Figures 37, 38, 39, 40) revealed varying degrees of progress toward the target skills in L.'s program. The skill of paying attention advanced not only in the weighted percentages correct, but also in progression through the substeps comprising the target skill. The same pattern was noted for the target skill of unbuttoning. The most progress was made in the skill of teaching L. to speak so she could be heard instead of her usual indistinct whispering. This skill showed improvement both in terms of weighted percentage of correct responses and in progression

through the substeps comprising the skill. Again the greatest amount of improvement was noted during the T2 and T3 phases when reinforcements were reinstated, after a period of no-reinforcement.

Only the skills of putting on a sweater and buttoning did not improve during the tutoring sessions. The skill of putting on a sweater showed a decrement in weighted percentage of correct responses which was probably due to the long time delay between sessions in which this skill was tutored. The skill of buttoning was only tutored during one week, because it was found to be too difficult for Tutee L.

The progress tests, representing the number of target skills classified as learned indicated no improvement throughout the tutoring project. An addition of one skill was made after the L2 phase probably, in part, due to L.'s teacher emphasizing the skill during the latency period. The progress tests were unable to detect fine improvements in the target skill because they only measured attainment of the final goal behavior.

An interesting pattern was noted in most of the forms of data collection for Tutee L. This was the accelerated pace of improvement noted during the last two experimental phases. Although L.'s behavior changed little when reinforcements were removed from the program, she showed much progress when social rewards were reinstated into the T2 phase. Even greater improvement was noted when both types of reinforcement (social and primary) were given for correct responses during the T3 period. Although this increase in performance could be attributed to maturational factors, the fact that the

increase was so marked suggested that the change in experimental procedures was a possible cause. An explanation for this phenomenon could be that the B2 phase was not long enough to extinguish the behavior patterns established during the T1 period. Thus, when reinforcements were reinstated during the T2 and T3 phases, L. displayed improvement because of the sudden change in reinforcement contingencies. Another explanation for this behavior could be that L. was not really under the control of the reinforcements until she perceived that they could be taken away; and, consequently she was more motivated to work for reinforcements when these were reinstated.

It appeared possible that L. did benefit in some ways from the tutoring experience, although in many tutoring situations her behavior was unpredictable. Her mother reported that L. improved in dressing skills during the program, and also stated that she benefited socially. It was the opinion of the experimenter that the addition of negative reinforcement techniques into L.'s program might have been beneficial, especially in teaching her to speak out loud. Her whispering behavior was quite strong, possibly due to the intermittent reinforcement (attention) that she was receiving.

CHAPTER IV

RESULTS: GENERAL

Reliability Checks

An attempt was made to assess the reliability of the data collected by the sixth grade tutors. This was accomplished by having the assistants count the number of correct and incorrect responses per tutoring session and compare their results with those of the sixth grade girl who served as tutor (See Appendix H for Reliability Check Form). Every attempt was made to obtain a reliability check on each of the sixth grade tutors twice during the tutoring program. However, due to absences one tutor was checked only once and another was checked three times. A total of twenty reliability checks were taken.

A percentage of agreement[6] was determined for the twenty reliability checks (See Table 3).

Table 3

Percentage of Agreement for Reliability Checks

Number of Agreements	457
Number of Disagreements	13
Total Number of Opportunities to Agree	470
Percentage of Agreement	97.2

[6]A disagreement was scored if a response was classifed (either right or wrong) differently by each recorder and/or if there was not a consensus as to whether a response actually occurred.

From Table 3 it can be seen that the counter and the experimenter's assistants agreed 97.2% of the time. This indicated that there was a very high degree of agreement between the assistants and the counters. In other words, these data gave evidence to indicate that in the present study, the sixth grade tutors were capable of accurate observations and recording of the behavior of the tutees during the daily tutoring sessions. However, reservations must be made in interpreting these results. The physical arrangement of the tutoring compartments made it difficult for the checkers and the tutors to record their results in isolation from one another. Thus, the fact that the checker and the tutors were never out of eyesight of each other could account for some of the high degree of agreement.

Behavior Modification Tests

Four tests dealing with the principles of behavior modification and specific tutoring techniques (See Appendix E) were administered to the ten tutors during their training and during the first two weeks of actual tutoring. These tests were again administered to the tutors upon termination of the program to determine if the tutoring experience would significantly increase their knowledge and understanding of behavior modification principles.

Table 4 presents the mean scores of each tutor for the behavior modification test for the pre and post conditions. A Wilcoxon matched-pairs, sign-ranks test (Ferguson, 1966) was calculated for the data to determine if a significant difference in scores existed between the pre-test and post-test. The value of T was found to

be equal to 1.5 which for an N = 9[7] was significant for a two-tailed test at the .01 level.

Table 4

Mean Scores for Each Tutor on the Behavior Modification Tests for the Pre and Post Conditions

Tutor	1	2	3	4	5	6	7	8	9	10
Pre-test Means	3.37	2.81	3.50	2.63	2.63	2.25	4.25	2.88	2.13	3.13
Post-test Means	3.31	4.31	4.31	2.94	3.69	2.63	4.25	3.63	2.19	4.25

It was found, therefore, that the post-test means were significantly higher than the pre-test means indicating that the tutoring experience appeared to be an effective approach to teaching behavior modification principles to the sixth grade girls in the present study.

Another illustration that the tutoring experience was a promising approach to learning the principles and application of behavior modification was shown by the tutors of Tutee J. These tutors desired to teach J. to read a few words and by themselves designed a program in which a word was taught in a series of substeps. Each letter of a word was placed in front of J. in order and on separate cards. The tutors taught the sound of each letter first and gradually blended the sounds to form the word. The two tutors indicated that they understood the principles of breaking down target behaviors into smaller substasks and subsequently chaining responses while

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[7]Tutor #7's scores were not included in the analysis because pre- and post-test means were tied (Ferguson, 1966, p. 361).

fading prompts.

As an additional measure the experimenter asked the sixth grade tutors to write down some of the things they learned and/or liked about the tutoring program. These statements are presented in Appendix S. Since the question was phrased positively the statements made by the tutors were also positive in nature. Many of the statements of the tutors were concerned with the rewards given to the tutors, or activities with the experimenter. An equal amount of comment consisted of altruistic concerns. A few comments referred to the specific behavior modification principles used in this study. In general, the comments made by the tutors indicated that all of them enjoyed participating in the tutoring program.

Post-Program Questionnaire

A post-program questionnaire was completed by the parents of all the tutees (See Appendix I). The main purposes of the questionnaire were to ascertain the parents' general impression of the tutoring program and to determine if there were any generalizations of the skills emphasized during the program to the home environment.

The parents' general impression of the program ranged from "good" to "very good." (One parent did not answer this question.) Four of the five parents answered that they felt their child had benefited from the program. Most benefit was seen to occur in the social and emotional development of the children. Likewise, four of the five parents mentioned some changes in behavior occurring at home during the program. Three of the parents mentioned improvement

in skills that were emphasized during the tutoring program. The fourth parent mentioned an improvement in her child's self-assurance. One parent could not answer conclusively as to the benefit her child received from the program. She also could not detect any changes in her child at home.

Another point of interest was the question regarding the communication between the home and the tutoring project. Three of the parents felt there was adequate communication from the program supervisor concerning the tutoring program. One parent did not answer this question but did seem appreciative of the individualized data that was presented in her child's post-program booklet. The last parent felt that there was not adequate communication between the home and program supervisor. However, no suggestions were offered as to how it could have been improved.

Likewise, the experimenter wished to determine what sort of communication existed between the tutors and their tutees outside of the tutoring sessions. One set of tutors showed remarkable outside interest in their tutee, in that they were in constant communication with their tutee's family and took their tutee on an outing to a park. Two of the parents met their child's tutors at the explanatory meeting held after the tutoring project had terminated. Another parent had had some association with the sixth grade tutors because she was on staff at the school for retarded children. One parent reported no communication between her child's tutors and the home.

A few added comments made by some of the parents were also of interest. One parent was very favorably impressed that the tutoring

program gave the normal child a chance to work with, and perhaps better understand the retarded child. Another parent expressed concern over the behavior modification principles in that she hoped the child would learn to work for the satisfaction of learning, rather than for food reinforcements.

It appeared that for the most part a favorable impression was gained by the parents concerning the tutoring program. All but one of the parents felt that their children had benefited in some way from the tutoring experience. There was also some evidence to indicate that some of the target skills emphasized during the tutoring sessions were generalized to the home situation.

CHAPTER V

DISCUSSION

Introduction

Since individual programs had been arranged, the results were just as varied as the individual subjects. For instance, although all five of the tutees appeared to improve over the duration of the tutoring program, there was still great variation in their responses. A few of the tutees improved on all of the target skills in their programs. In some instances no progress was noted because of inability on the tutee's part to accomplish a certain task, lack of motivation, the possibility of inappropriate programming, or the fact that a certain target skill was already a part of the tutee's behavioral reportoire.

These problems exemplify the fact that what appears feasible and necessary in theory is not always practically possible. In the organization of any tutoring program using behavioral management techniques, one must be aware of problems arising from differences in motivational systems of the tutees and discrepancies between what a child <u>can</u> perform and what he <u>will</u> perform. Different reinforcement contingencies often exist in differing environments producing behavior that is appropriate to each setting. Therefore, the situation arises in which a child can perform a behavior perfectly during the tutoring session, but does not perform the same behavior at home or in the classroom. Another problem (especially apparent in dealing

with multiply-handicapped children) is the inability to accurately assess, prior to the tutoring program, what a child can physically accomplish within the bounds of his disability. These situations coupled with children who are not reinforced by traditional rewards often produce results not expected in the initial organization of the tutoring program.

The possible reasons for improvement in each of the tutees did not appear similar either. G. appeared to be definitely under the control of the reinforcement contingencies, being especially motivated by social reinforcement. Although evidence was anecdotal, Tutee D. seemed to be more motivated by primary reinforcement. Tutee J., although showing no decrement in correct responses on the daily observation records, decreased in performance on a more global measure of improvement (progress tests) when reinforcements were withheld. Tutee L. exhibited no change in behavior when reinforcements were removed, but definite and increasing improvement was noted when social then primary reinforcement were reinstated. Tutee C. appeared to be under the control of the reinforcements (especially social) on two of the target behaviors comprising her program.

It seemed, therefore, that behavior modification techniques hold some promise in the tutoring of multiply-handicapped children. It also became obvious that different children react differently to similarly-structured programs. The need for more finely tailored programs became evident, since the children in the present study reacted differently to programs that were dissimilar in content for each, but very similar in overall structure.

Since each child has a different motivational system, it should be the task of the program supervisor to assess this system and plan accordingly. Since all of the handicapped children progressed, it appeared that the tutoring program effectively motivated each of the tutees to a certain extent. The results indicate that the use of reinforcement techniques was successful in most of the situations, but that other motivational factors confounded these results.

There was also evidence presented to indicate that children can be effective tutors of younger children using a systematic approach to tutoring. A very high degree of agreement was found between the tutors and the reliability checkers in the recording of correct and incorrect responses. The experimenter also found that daily observation records maintained by the tutors were usually neat, easy to read, and contained all the relevant information needed for plotting the various graphs.

The pre- and post-tests used to measure comprehension of behavior modification principles and specific tutoring techniques indicate that the tutors in the present study did acquire a working knowledge of very basic behavior principles. The significantly higher post-test means on these tests indicated also that a practicum in the use of these principles was an effective device for teaching reinforcement principles.

The post-program questionnaire completed by the parents showed that in most cases improvement was noted in the home environment during the course of the project. Some of the improvements, such as social and emotional changes cannot be definitely attributed

to the tutoring project. However, in many cases progress at home was observed in the target skills comprising a tutee's program.

The main purpose of the present research were fulfilled in that it was shown that normal children can be used as reasonably effective tutors of younger, handicapped children using a systematic tutoring approach. The present investigation made substantial demands on the younger tutors in view of (a) the relatively short period of training prior to tutoring, and (b) the complexity of behavioral and physical problems presented by the multiply-handicapped children. It seems reasonable to think that a more extended and intensive preparatory program in behavior modification and tutoring experience with less severely handicapped children would have produced improvements for both tutors and tutees. Many questions were raised by the results obtained in the present study. Among these, certain issues of methodology and research applications are worthy of note.

Methodological Conerns

In the teaching of behavior modification techniques to the sixth grade tutors, only principles involved in the strengthening of positive behaviors were stressed. (While negative reinforcement is a method of strengthening behaviors it was not included in the training of tutors.) It was felt that school-aged children would find it difficult to carry out the principles of negative reinforcement, extinction, and punishment since these techniques require considerable vigilance and sophistication in their correct application. Since the application of these techniques is basically a

negative one (and in the case of punishment, usually emotionally toned), it would have been difficult to obtain any type of consistency in their use. It was felt that these techniques should be reserved for adults who are more knowlegeable in the principles of behavioral mangement.

Another reason for not using punishment, negative reinforcement, etc. was to maintain the motivational level of the tutors. It was felt that the use of any of these techniques would lower the motivation of the tutors. The experimenter felt that to maintain motivation in this type of program all aspects should be as positive as possible. The tutors, for instance, were looked upon as "teachers" as opposed to "disciplinarians" (which might have been the case if the other techniques were employed).

The use of a control group was another serious problem in the present research. In the present study, this was not deemed feasible for a variety of reasons. In dealing with a sample of multiply-handicapped children it is impossible to find a matched sample, especially considering the limited subject pool available for this project. It is obvious from the descriptions of each of the five tutees that each was very different in intelligence, motivational and personality factors, as well as the type and extent of their handicap.

Other practical considerations in the use of controls were the basic problems of time and manpower. If the same subject pool were used, conflicts in timing were certain to occur. Lack of space to run two groups was also an important factor. Finally, a theoretical

problem was involved in the use of a control group acquired from the same subject pool. The isolation of the control group in such a condition could not be insured. This situation made it more than likely that tutoring methods would be traded between the two groups.

It was for these reasons that a control group (and/or a placebo group) was not included in the designing of the present research. Instead each child was used as his own control by first being measured on a baseline condition, then a treatment condition, and thirdly, a return to the baseline condition (Browing and Stover, 1971).

Care must be exhibited in generalizing the results obtained from a project using the case study approach which was tailored to the individual subject's needs and capabilities. The absence of a control group also makes generalization difficult. In the present study, the programs for each tutee were arranged in consultation with the parents and in two cases the teacher. The individualized nature of each program ruled out any type of generalizations concerning the organization of any one program.

However, perhaps some general rules can be obtained from the structure of the program as opposed to its content. The behavior modification techniques did appear to elicit some improvement in the tutees; and, thus, perhaps could be considered an effective tutoring approach for these types of children. However, the results were not without question since in a number of situations the tutee's did not seem affected by the reinforcement contingencies. The main purpose of the present study was to demonstrate that older elementary school

children can be used as tutors of younger multiply-handicapped children following a systematic tutoring schedule. The present research did provide evidence that this was possible, and also that behavior modification showed a degree of promise as a systematic tutoring approach when applied by elementary school girls.

In using a ABACD design as outlined by Browning and Stover (1971) in which subjects were measured on a replicated baseline measure, questions arise as to how closely the return to baseline reproduces the initial baseline conditions. Theoretically, it is impossible to totally replicate the baseline conditions. For instance, if a favorable rapport has developed between the tutor and tutee, performance could be maintained at a high level because the presence of the tutor has attained secondary reinforcement properties. Although it is relatively easy to withhold primary reinforcement, the total removal of social reinforcement can be very difficult since it is often given in very subtle ways. During the return to baseline procedures in the present study the tutors were given extra points on their token system if the experimenter could see no social reinforcement. This system appeared to eliminate most of the exuberance of the sixth grade girls, but it may have worked in an opposite manner to produce a second baseline period that was less reinforcing than the original.

The use of a replicated baseline measure also produces problems in that the effects of previous treatment periods often persist into the extinction phase. If the second baseline phase were longer in the present study, the experimenter felt that more of the tutees would

have shown decrements in their performance. However, an extension of the second baseline was not viewed as practical because of the strained atmosphere present during this phase. Not only were disruptive behaviors occurring in the tutees, but the tutors seemed also to be losing some of their motivation for the project.

It is possible that other factors besides the use of behavior modification techniques were responsible for the results obtained. The Hawthorne effect, which predicts that subjects undergoing any novel condition will show improvement, could be responsible for some of the progress noted. However, since most of the improvement continued over the duration of the program other factors were probably involved. The systemization rather than the content of the tutoring program also could have produced some of the positive changes. For example, a commitment to a single method throughout the study rather than a collage of different approaches probably led to greater consistency and efficiency in the tutoring sessions.

The increased ratio of tutors to handicapped children could also account for some of the positive behavior changes noted during the tutoring project. The fact that the tutors themselves were children could have aided in the establishment of rapport between the two groups, resulting in greater progress on the part of the tutees. Finally, a tutee's natural maturation during a three-month period could account for some of the improvement noted in skills. This is especially true for socioemotional types of improvement. However, improvement in specific skills that were tutored during the program were more likely to have been the results of the methods used during the project.

Although all these reasons may be factors in explaining some of the increase in performance during the project, there was substantial evidence to suggest that the behavior modification principles played an integral role in the training of the target behaviors.

Applications

Some of the possible applications for this study have been discussed earlier in the introduction to this report. The most immediate application is in the education of multiply-handicapped children. It provides these children with a chance to receive the individualized instruction which they are so often in need. Through the programming of basic self-help skills, a child can learn a few basic skills which, in turn, will make him more independent and less reliant on the care of others in the classroom. It relieves the teacher of some child-care duties, and allows her more time for teaching other skills. Special tutoring programs also provide the teacher with an outside resource to aid in the education of a child who is in need of special attention.

An advantage of a tutoring program using a behavior modification framework is that the responsibility of its success is placed on the program itself and not on the child. If a child does not improve in other types of programs, usually the failure is considered to be the child's. A failure in a behavior program is seen to be caused by a short-coming in the program itself. The behavior modification program, therefore, attempts to conform to the needs of the child rather than the child conforming to the needs of the program.

Another advantage to the type of program used in the present study was that behavioral objectives were outlined before the program's initiation. Although this does not constitute a learning contract, it does provide parents and teachers with knowledge of the specific behaviors emphasized in the tutoring program. It also facilitates reporting results in that a child's progress can be viewed in terms of specific rather than in terms of general criteria. It should be possible to point out exactly at what level a child performs any given behavior, if objectives and criteria are carefully outlined for any target skill.

The use of older children as tutors for younger handicapped children would appear to have practical application in the education of the older child as well as the handicapped child. Such programs could serve as practicums for social study-type courses, especially since subjects such as psychology and sociology are becoming more and more popular at the junior and senior high school level. The data from the present study indicated that actual experience with the use of behavior modification significantly increased comprehension of the principles.

Besides the specific knowledge of behavior principles, the experimenter felt that other more important lessions could be attained by participation in such a program. The systemized approach used in a behavior modification program requires careful execution, a thorough knowledge of the substeps and criterion level for each target skill, and a fair amount of common sense. The accurate recording of data also demands constant vigilance during the tutoring

session. The discipline necessary to function effectively in such a program would aid the children serving as tutors in the skills of following directions and working effectively in situations where structure is necessary. The fact that all the tutoring and all the recording of data were the responsibility of the tutors accentuated the fact that the tutors were a very valuable part of the teaching team in the education of their tutee.

Perhaps the major benefit of a tutoring program which integrates normal and handicapped children is the knowledge and understanding gained by the normal child of children who are different. One of the mothers of the handicapped children remarked that she felt this integration was a very important part of the tutoring program. The handicapped child also benefits from this association with non-handicapped children. Often children with special problems find themselves isolated in a milieu of all handicapped children, especially if they attend a special school. A tutoring program such as the present one allows the handicapped child to meet and interact socially with other children who have no disabilities.

The question of parent involvement in the education of their children is of current concern to many educators. The present tutoring program contained no active involvement of the parents, although every effort was made to keep the parents informed as to what occurred during the tutoring sessions. All the parents (both of the tutees and tutors) were also invited to attend a meeting held at the end of the tutoring program to explain methods and results. At this meeting individually prepared booklets (See Appendix Q) were distributed to each

of the parents of the tutees to present specific information concerning their child's progress. More active parent involvement would be a valuable addition to the tutoring program. Principles and methods used in the program could be explained to the parents, and perhaps a home-based tutoring program could be initiated to complement the tutoring program at school.

The use of parents as tutors for their own children has many limitations, most often in the finding of enough time. The handicapped child is usually not the only child in a family and parents frequently cannot find the time to devote to only one member. This situation really points out the need to involve the whole family in this type of program. Parents who are employed often lack time to participate in any long-range programs, and oftentimes such programs can only reach one parent (usually the mother) because of employment of the other parent. Another crucial factor in the use of parents is the need for a babysitting service. It could amount to quite a sum of money to pay a babysitter to free the parent to attend a series of meetings. Also obtaining a babysitter for a child who is handicapped is very often extremely difficult. Parent programs, therefore, must work on a very flexible schedule if they are to be successful.

On a more global outlook, the whole community should be involved in the education of its children. By using children from a different school system to participate in the tutoring program some amount of community involvement was accomplished in the present study. This involvement extended beyond the actual tutors in that a number of

their parents indicated interest in the tutoring program. A few of the tutor's parents attended the explanatory meeting held after the termination of the tutoring program; and one mother and her daughter took one of the tutees for an outing in the park. The community at large was also informed about the project by way of a descriptive article in the local newspaper.

Perhaps one of the greatest advantages to the organization of such a program is its economic feasibility. In the present study, fifteen children were supervised by two adults (the experimenter and the assistant). Although this is a rather large adult to child ratio (e.g., compared to a classroom), it is very low considering that five highly specified programs were being carried out simultaneously. The program in the present study lasted for only one hour per day. If, for example, tutoring projects could be used as part of course credit for older children, one supervisor would be able to run a few sessions with different children every day. A parent could also serve as the assistant to the supervisor. This would maximize the number of children from both schools that could benefit. The persistent problem in behavior modification for severely handicapped children - that of providing individualized programming and training - could be more nearly resolved. The actual cost of such a program would appear to be considerably less, considering the number of children served, than the hiring of a resource person who could only handle one child at a time.

In summary, the present study indicates that the results of non-handicapped children tutoring younger multiply-handicapped children

are encouraging. There appears promise of benefit to both tutors and tutees. Further advantages accruing to parents, teachers and the community seem possible from both economic and educational points of view.

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Appendix A

Letters to the Two Schools Explaining the Purposes of the Program

Our Lady of Perpetual Help

Dear _____,

The purpose of this letter is to briefly introduce to you a research proposal that I am currently undertaking in the Educational Psychology Department at the University of Alberta. I hope you will find this proposal interesting and worthwhile to the parties involved.

Being a special education student, the problems of teaching the mentally retarded (especially the severely retarded) are of special interest to me. It has occurred to me that perhaps fifth and sixth graders could be trained to serve as tutors of these severely handicapped children in the teaching of self-help skills (e.g., eating, dressing themselves, etc.).

I am contacting _____, the principal of the Robin Hood School in Sherwood Park to see if she would by interested in setting up such a program in the school for her children. Since most of her children are incapacitated by severe physical handicaps, it is imperative that such a program be carried out within the Robin Hood School. Due to this restriction, I was wondering if some of the fifth and sixth graders at Our Lady of Perpetual Help School would be interested in participating in such a project.

The program will tentatively last from the middle of February until the middle of May. Because of the need for very individualized work in such a program, only a small number of students will be involved. From the Robin Hood School I would prefer five children, and from the fifth and sixth grade classes of Our Lady of Perpetual Help, I will need only ten children. Each of the five handicapped children from Robin Hood will be paired with two of the older children. These two tutors will take turns -- one actually teaching the handicapped child, and the other taking a running account of the progress in the self-help skills that are being taught to the child. Each tutoring session should last only 20-30 minutes.

The method that my tutors will use with these severely handicapped children is not a complicated one, and is easily taught to non-professionals. It is of interest to me to determine if children of fifth and sixth grade age can learn to effectively apply these principles.

Appendix A (continued):

Each self-help skill will be broken down into smaller subtasks. The tutors will start with the first subtask and eventually work their way up to the total task. Each correct response in the handicapped children will be rewarded by a small food treat and praise from their tutors. By rewarding appropriate behaviours in these children, the probability of their repeating a good behaviour is increased; thus a self-help skill can be learned.

I hope you will find this proposal acceptable and relay my interests to Our Lady of Perpetual Help School. Besides the obvious benefits to the handicapped child in learning how to care for himself, the child will have a much needed opportunity to relate to another individual outside his usual handicapped milieu.

This project is also of more than academic interest in connection with the fifth and sixth grade tutors. Participating in such a worthwhile program could be used as a practicum in connection with the children's social studies classes and could be used as an effective teaching tool for these children. Social awareness, the understanding of people who are different, and the feeling of self-accomplishment are important virtues to instill in ay child. However, there are no curriculums based on these ideals -- Experience remains the best teacher.

I hope this proposal meets your approval; and that access to Our Lady of Perpetual Help School will be possible. I will be happy to meet with you to discuss any further questions you might have concerning this program. My advisor _____, Department of Educational Psychology, will also be available to discuss any further points with you.

Thank you so much for your consideration in this matter.

Sincerely yours,

Appendix A (continued):

Robin Hood School for Retarded Children

Dear _____,

About a month ago my advisor, _____, and I visited your school in Sherwood Park.

Being a special education student especially interested in the education of the severely retarded, the Robin Hood School interested me very much. I am currently involved in researching the possibility of using older, normal children as tutors for severely handicapped children (especially in the area of self-help skills; such as, eating, and dressing).

It has occurred to me that your children would be perfect pupils for my tutors. I was wondering, therefore, if you would be interested in setting up such a program at the Robin Hood School. Because of the physical handicaps of some of the children at your school, I am contacting _____, Superintendent of Our Lady of Perpetual Help School to see if he would be willing to participate in such a program using 5th and 6th graders as tutors.

The program will tentatively last from the middle of February to the middle of May. Because of the need of very individualized work in such a program, only a small number of children will be involved. From the 5th and 6th grade classes of Our Lady of Perpetual Help School I would prefer 10 children, and from Robin Hood School, I will need only 5 children. Each of the five handicapped children from Robin Hoold will be paired with two of the older children. These two tutors will take turns--one actually teaching the handicapped child and the other taking a running account of the progress in the self-help skills that are being taught to the child. Each tutoring session should last only 20-30 minutes.

The method that my tutors will use with the children is not a complicated one and easily taught to non-professionals. It is of interest to me to determine if children of 5th and 6th grade age can learn to effectively apply these principles.

Each self-help skill will be broken down into smaller subtasks. The tutors will start with the first subtask and eventually work up to the total task. Each correct response will be rewarded by a food treat and priase from the tutors. By rewarding appropriate behaviors in these children, the probabilities of them repeating good behaviors is increased; thus, a self-help skill can be learned.

Appendix A (continued):

I hope you will find this proposal acceptable and that access to the Robin Hood School will be possible. It is my feeling that the handicapped child can gain much from such a program. Besides the obvious benefit of teaching a child to care for himself, the child can gain much from such a relationship with another child who is seen as a rewarding individual. A child who can somewhat care for himself will also be less of a problem to his parents and teachers.

The 5th and 6th graders will also be benefitting from such an involvement in a worthwhile project. It is feasible that such a program could be used as a practicum in conjunction with their social studies classes. It could also be a way to instill in them some social awareness and understanding of people who are different.

I hope this proposal meets your approval and that access to Robin Hood School is possible. I will be happy to meet with you to discuss any further questions you might have concerning this program. My advisor _____, Department of Educational Psychology, will also be available to discuss any further points with you.

Thank you so much for your consideration in this matter.

Sincerely yours,

Appendix B

Permission Form: Tutors' Parents

Dear Parents,

As you have probably already heard from your child a program is being set up at the Robin Hood School for Retarded Children aimed at involving normal children in the education of the retarded youngster. The sixth grade students at Our Lady of Perpetual Help School who have volunteered for this program will serve as tutors for younger, retarded children in the learning of basic self-help skills (for example, dressing, eating, etc.). It is my feeling that both groups of children will profit greatly from such a project.

The program itself will run every school day from 12:00-12:55 p.m. at the Robin Hood School. The children will eat their lunches as a group at this time, so that no school time is lost. There will be no extra time or homework included in this program.

I hope that your child will be able to participate in this program. The tentative length of the program will be from the middle of March to the first of June. Thank you very much.

Sincerely yours,

P.S. If there are any questions concerning this project, please feel free to call me.

.....

Please circle one.

I (would, would not) like my child to participate in this program.

NAME.....

ADDRESS.....

PHONE.....

Appendix C

Training Program For The Tutors

First day of training. On the first day of the training session, the girls were introduced to an outline of the program. They were asked to select a partner, and a tutee was assigned randomly to each set of girls. The girls were told briefly about the children with whom they would be working, and the daily schedule of the program. Then the girls were given a piece of paper and asked to write down anything that they liked to do and any objects or gifts that they liked to receive. After this was accomplished they were told, "I will take these papers home and I will make a list of the things that I can give you. Tomorrow and all through this program I will give you opportunities to earn rewards (points were termed rewards for the first few days). When you have earned a certain amount, you can trade them in for a reward on the list." The girls were asked to think of more rewards that night at home. All homework was to be "thinking homework", no written work was to be required.

Second day of training. The second day of the training session was spent mainly in the discussion of the point system. The girls were taught how they could receive points, and how to keep records of their points on a daily basis. The girls were then given a chance to discuss their homework which was to think of other rewarding objects and activities. Each answer was given at least one point, and specially good answers or new ideas about rewards (e.g., social rewards) were praised highly and given two points. In this way the tutors

were encouraged to answer during the training session and were rewarded for introducing new ideas to the class.

After this discussion, five girls were asked to come forward, and the experimenter complimented each of them. The girls were asked what differentiated these kinds of rewards from the types of rewards (objects and activities) that the girls had been previously discussing. In this way the tutors were introduced to what the experimenter termed "material" and "social" rewards.

This discussion eventually led into the topic of the difference between "unlearned rewards" (e.g., food and warmth) and "learned rewards" (e.g., social rewards). This concept was explained to the girls by using the example of a mother feeding a bottle to a small baby. The baby was receiving food, an unlearned reward; and, consequently, felt good. While the baby was being fed, the mother would talk to the child and soon just the act of talking (a social reward) would make the baby feel good. This concept of pairing primary reinforcers with neutral events to produce a secondary-type of reinforcer seemed to be the most difficult idea for these sixth grade girls to grasp. Although a few of them seemed to understand this principle by the termination of the program, most of the girls retained the assumption that being socially rewarded is innately pleasing to all individuals.

The second training session also involved meeting the tutees with whom the girls would be working. The two groups of children from this day had a common lunch hour. The atmosphere on this first day of contact was somewhat tense, since most of the tutors had had

no experience with mentally retarded children. However, this strained atmosphere rapidly changed as both sets of children became more familiar with each other and the routine of the program.

Third day of training. The third day of training began with the first of several tests on the principles of rewards that were discussed the day before. (See Appendix E for copies of the questions used on the four tests administered during the training program.) Each test consisted of four or five questions (usually fill-in-the-blank type) that were assigned a certain number of points according to their difficulty. After the test, the experimenter gave immediate feedback to the girls by going over each question with them.

On this day the idea of counting behaviors was introduced. A behavior was defined as "anything we do" or "any act". An experiment was carried out by the experimenter to illustrate why some behaviors are easy to count and others are hard to count. The girls were instructed to divide their paper in half to count two behaviors. The experimenter informed them that she was going to read to them for five minutes from a book. During this time they were to count two behaviors. The experimenter said she would explain each behavior once and would answer no questions about the behaviors. The first behavior to be counted was the number of times the experimenter licked her bottom lip during the reading. The second behavior was described as counting each time the experimenter seemed interested in what she was reading. After the reading each girl was asked what her final account was for each behavior. The tallies for licking

the lip varied little; but, as was expected, the tallies for "being interested" varied from individual to individual. This experiment was used to impress upon the tutors the need to accurately describe behaviors that were to be counted. The tutors were told that they would be responsible for counting certain behaviors during the tutoring sessions. The girls were asked to look around their homes for behaviors that were easy to count and for those that were hard to count to discuss in the next class.

Fourth day of training. The fourth day of training began with the discussion on counting behaviors. Each girl had a turn to give the examples that she had discovered. The experimenter then asked if there were ways to make some behaviors easier to count. Most of the girls answered that a behavior that was made more physically observable would be easier to count. The experimenter demonstrated how some behaviors could be made easier to count by breaking them down into smaller units or sub-behaviors, and then defining or pinpointing accurately certain behaviors (target skills). The girls were told that they would use this method to count behaviors.

Also introduced on this day was the idea that behaviors which are followed by rewards are more likely to occur again. The girls were asked to explain the connection between rewards and behaviors. This question was given a three-point value, so that the girls were very motivated to be the one with the correct answer. It was not long before one answered that rewards after a behavior will make a person repeat that behavior again.

A new motivational factor for each of the tutors was also instituted on this day. One girl was asked how many social rewards she had received from the others in the class. The whole class would receive one point for each one that she received. The tutors were instructed that the experimenter would do this periodically throughout the program without prior warning. This was not only instructional as to the nature of social rewards; but also extremely motivating for regular attendance, not to mention maintaining a congenial atmosphere during the sessions.

A two-day break in the training sessions followed because of the weekend.

Fifth day of training. On the fifth day of the training period the second test was administered (See Appendix E). This test emphasized counting behaviors and the effect of rewards on behavior. Immediate feedback was again given as soon as all the girls finished their tests. Besides discussing the test, each girl was told what food reinforcement (determined from a pre-program questionnaire filled out by the tutee's parents) they would be using with their tutee. On this day, also, a few of the tutors learned what target skills they would be emphasizing with their tutee.

Sixth day of training. Day six of the training program introduced the method of recording behavior. For the sake of clarity, one girl in each pair was termed the "tutor" and one was called the "counter". The tutor was made responsible for readying the food rewards every day and the actual teaching of the tutee. The counter

was made responsible for the arrangement of recording materials and the actual data collection during the tutoring session. The girls were instructed to change roles every three days of tutoring. Each pair of girls was given a colored clipboard to use during the tutoring sessions. (These clipboards were also very motivating objects to the girls.) The recording sheets contained an area for behavior description, data, time, name of tutor, the number of correct responses, the number of incorrect responses, total number of responses, percentage of correct responses, and percentage of incorrect responses (See Appendix F). The girls were instructed in how to fill in each space. The percentage correct and incorrect were not required to be computed but could be done to acquire bonus points towards the 50 points required for a reward on their token system.

Since the filling out of the daily record sheets was fairly self-explanatory, the experimenter demonstrated six of the target skills to the specific girls who would be dealing with them. The experimenter's assistant served as the tutee, and the experimenter proceeded through each specific step in the program, being certain to illustrate the correct way to reward the tutee by placing the food in his mouth and praising him simultanecusly. The girls were instructed not to move to a higher step in any program unless five consecutive correct responses were obtained.

Seventh, eighth and ninth days of training. The seventh, eighth, and ninth days of the training program were almost entirely concerned with the practicing of the programs that were established

for each tutee. Each girl per pair during these periods practiced being the tutor, with the other girl playing the part of the tutee. The experimenter and the assistant moved from group to group demonstrating and answering any questions.

In addition to this, on the ninth day the girls were given Test 3 (See Appendix E), dealing with their specific program and criterion for advancing in their program, etc. They were also instructed in the administration of a progress test (See Appendix G). This was a situational type of test in which the tutee was required to perform the final goal behavior of his program, being rewarded socially only. The girls were taught how to give these tests and score them.

This ended the formal training sessions for the tutors. They were trained in an ongoing manner during the remainder of the project as specific problems arose. An additional test (See Appendix E) was administered after two weeks of the actual tutoring. This test concerned itself mainly with questions about methods of giving reinforcements and the importance of not breaking the contingencies between the behavior and the reward.

During the first week of actual tutoring, problems were found in the neatness of the daily records. Some of the girls had a tendency to try and cram all their data into one space. It was also discovered that a few of the girls did not understand the method of tallying in which counts of five are grouped together with a diagonal slash. These problems were quickly cleared up. When reinforcements were instituted into the program, there was a general problem of too

much delay between the behavior and the reward. This problem was remedied quickly by demonstrating the correct procedure. One pair of girls had many problems in this area, besides the problem of wasting time during the tutoring sessions. They were subsequently rewarded for accomplishing more in their tutoring periods. Despite these problems (which were somewhat inevitable since the tutors had had no actual experience in these techniques until the tutoring part of the program was started), the experimenter felt that the training program was successful in preparing the sixth graders as behavior therapist, as was evidenced by their performance and test answers.

Appendix D

Replica of Point Tallying Sheet

NAME: _____

Point Sheet

Date	Atten-dance	Answer in Class	Paper Work	Pop Quizzes	Other Work	Bonus*	Total

Appendix E

Test Questions Used in the Training of Tutors

Test One

1. A _____ is something pleasant that people will work for. (1/2 pt.)

2. There are two kinds of rewards. Name them. (1 pt.)

   1. _____ 2. _____

3. Some rewards are unlearned. Name one. (1/2 pt.)

   _____

4. For praise (compliments, hugs, "thank you's") to become a reward it must be p_____ with an unlearned reward. (2 pts.)

Test Two

1. How do we learn social rewards? (1 pt.)

   _____

   _____

   _____

2. Put an "H" by hard behaviors to count.
   Put an "E" by easy behaviors to count. (2 pts.)

   ____ being nice
   ____ making your bed
   ____ being worried
   ____ putting on your socks
   ____ combing your hair
   ____ wrinkling your nose
   ____ feeling interested
   ____ your mother saying "come here"

3. What is the effect of rewards on behaviors? (1 pt.)

   _____

   _____

   _____

Appendix E (continued):

4. How can some behaviors be made easier to count? (1 pt.)

_____

_____

_____

Test Three

1. What is a behavior? (1 pt.)

_____

_____

_____

2. What behaviors are you working on with your child? (1 pt.)

_____

_____

_____

_____

3. When do you move to a higher step in your behaviors? (1 pt.)

_____

4. What do you do if you move ahead and you don't get any correct response? (1 pt.)

_____

_____

_____

_____

5. What reward will your child get? (1 pt.)

_____

Test Four

1. (a) Why is it important to give your reward right after a correct behavior? (1 pt.)

(b) What happens if you don't give it right away? (1 pt.)

2. Why do we pair (do it at the same time) our social and material rewards? (1 pt.)

Circle right answer.

3. Food is an (unlearned, learned) reward. (1/2 pt.)

4. Social rewards have to be (learned, with us when we are born?) (1/2 pt.)

5. Do your rewards seem to be working? (0 pts.)

Appendix F

Replica of Daily Record Recording Sheets

Name: _____

Daily Records

Behaviors	Tutor	Counter	Time	Date	# Correct	# Incorrect	Total	Percent Correct $\frac{\text{\# Correct}}{\text{Total}} \times 100$	Percent Incorrect 100 - # Correct

Appendix G

Progress Test for the Five Tutees

Progress Test for D.

LOOK AT ME

1. Stand 5 ft. away out of line of vision. Say "Look at me". (repeat once). Score + if he looks at you.

SIT DOWN

2. D. is standing. Say "Sit down, D.". (repeat only once). Score + if he sits down.

STAND UP

3. D. is seated. Stand 5 ft. away. Say "Stand up, D.". Score + if he stands up.

UNBUTTONING

4. Sweater is all buttoned up. Say, "Unbutton your sweater". (repeat once). Score + if he unbuttons one of his buttons and starts on another one.

BUTTONING

5. Sweater is completely unbuttoned. Say, "Button your sweater". Score + if he buttons one of his buttons and starts on another one.

Tutor_____

Counter_____

Date_____

Appendix G (continued);

Progress Test for C.

LOOK AT ME

1. Stand 5 ft. away out of line of vision. Say "Look at me." (repeat once). Score + if she looks at you.

COME TO ME

2. Stand 5 ft. away. Say "Come to me." (repeat only once). Score + if she comes.

SWEATER OFF

3. Sweater is on. Say "Take your sweater off." (repeat once once). Score + if she takes her sweater off without help.

SWEATER ON

4. Hand sweater with bottom open toward her. Say "Put your sweater on." Score + if she puts sweater over her head and at least one arm through.

NAMING OBJECTS

5. Point to each 4 pictures. Say "What is this?" (repeat once). Score + if she names all 4 correctly.

ANSWER "YES"

6. Hold spoonful of ice cream before her. Say "Do you want some ice cream C.? Score + if she answers "Yes". (Do not give her the ice cream until all three trials are given.)

Tutor_____

Counter_____

Date_____

Appendix G (continued):

Progress Test for G.

SOCKS ON

1. Put socks where G. can reach them. Say "Put on your socks". (repeat only once). Score + if he puts one sock on and starts with the other.

SWEATER ON

2. Hand sweater with bottom open toward him. Say "Put your sweater on." Score + if he puts sweater over his head and at least one arm through.

WASH HANDS

3. G. is seated facing basin. Say "Wash your hands." Score + if he makes any attempt to wash his hands and dry them.

NUMBERS

4. Present G. with his numbers (1-10) one at a time out of order. Say "What is this?" Score + if he gets all 10 of them right.

TIME

5. Present G. with the clock and show the hours out of order. Say "What time is it?" Score + if he gets all twelve hours correct.

Tutor_____

Counter_____

Date_____

Appendix G (continued):

Progress Test for J.

CAPITAL LETTERS

1. Show (out of order) the capital letters to J. Score + if she names them all correctly.

SMALL LETTERS

2. Show (out of order) the small letters to J. Score + if she names all of them correctly.

NUMBERS

3. Show (out of order) the numbers 1-20. Score + if she names all of them correctly.

TIME

4. Show J. the hours on the clock out of order. Score + is she names all of them correctly.

Tutor_____

Counter_____

Date_____

Appendix G (continued):

Progress Test for L.

LOOK AT ME

1. Stand 5 ft. away out of line of vision. Say "Look at me" (repeat once). Score + if she looks at you.

PUT SWEATER ON

2. Hand sweater with bottom open to her. Say "Put your sweater on". Score + if she puts sweater over her head and at least one arm through.

UNBUTTONING

3. Sweater is all buttoned up. Say "Unbutton your sweater". (repeat once). Score + if she unbuttons one button and starts on another one.

BUTTONING

4. Sweater is completely unbuttoned. Say "Button your sweater". Score + if she buttons one of her buttons and starts on another one.

SPEAKING OUTLOUD

5. Stand 5 ft. away. Ask L. three simple questions. Score + if you can hear her answer.

Tutor_____

Counter_____

Date_____

Appendix H

Replica of Reliability Check Recording Sheet

Tutor	Counter	Checker	Time	Date	Behaviors	# Correct (Checker)	# Incorrect (Checker)	# Correct (Counter)	# Incorrect (Counter)

Appendix I

Post-Program Questionnaire for Parents

1. What is your overall impression of this program?
   ____Very Good ____Good ____Fair ____Poor ____Very Poor
   Why?
   _____
   _____

2. Did you notice any change at home in the child during this program?
   ____Yes ____No ____Can't really tell
   If so, what were they?_____
   _____
   Was this a good change? ____Yes ____No

3. Did you have any contact with your child's tutors during the program?
   ____Yes ____No
   Check which one(s): ____telephone
   ____letter
   ____in person (before June 28 meeting)
   ____in person (at June 28 meeting)
   ____other (what?_____)

4. Do you think your child benefitted from this program?
   ____Yes ____No ____Can't really say
   In what way(s): ____in school work
   ____socially
   ____emotionally
   ____other (what?_____)

5. Did you feel there was adequate correspondence between the home and the program supervisor? ____Yes ____No

   Any suggestions?

6. Any other comments?

Appendix J

Pre-Program Planning Questionnaire for the Tutee's Parents

Dear Parents,

We would like to start a program at Robin Hood School in which sixth grade students will attempt to train some of the children in some basic self-help skills. Would you like your child to be included in such a program?

_____ Yes _____ No

A. Check the box which best expresses your feeling about having your child learn the skill mentioned.

Skill	I do feel that this is an important skill.	I do not feel this is an important skill.	No Opinion.	My child already has this skill.
1. to pay attention.				
2. to stand up on command.				
3. to come when called.				
4. to sit down on command.				
5. to remain seated.				
6. to take off socks.				
7. to take off sweater or shirt.				
8. to take off pants.				
9. to put on socks.				
10. to put on sweater or shirt.				
11. to put on pants.				
12. to wash hands.				

B. Are there any other skills which you would like us to work on with your child?

_____Yes _____No

If so, what are they? (use other side) _____

C. Since small children are best rewarded by food treats, we plan to use them as rewards for correct behavior.

Could you number the following treats in the order that they appeal to your child.

1 = most rewarding treat

6 = least rewarding treat

_____ smarties

_____ sugared breakfast cereals. Which ones? _____

_____

_____ ice cream

_____ popsicles

_____ cookies

_____ toast

Are there any other such treats that your child finds very rewarding? _____

D. Is your child allergic to any types of food? _____Yes _____No

If so, which ones? _____

E. Does your child have any other physical handicaps that you feel we should know about? _____

_____

F. Would you be interested in attending any meetings concerned with theories and methods used in this study? _____Yes _____No

If so, which week nights are you most likely to be free for such a meeting? _____

_____

Name: _____

Address: _____

Telephone: _____

If there are any questions concerning this questionnaire or any other aspects of the program, please call _____

Please return this questionnaire with you child to school as soon as you have completed it.

Appendix K

Information Letter to the Parents of the Tutees Concerning the Program

Letter to D.'s Parents

Dear _____,

This is just a little note to let you know what behaviors we have decided to work on with D. First of all we will attempt to get him to look at the person who is talking to him, to stand on command, and to sit down when he is told.

Finally, we would like to set up a program to teach him to button and unbutton his coat or sweater. For this last task, it would be appreciated if you could send a sweater (or similar object) with buttons to school with D. to be used during the program. If possible, a garment with large buttons and button-holes would be better suited to make the movements easier for D. to understand.

Thank you for your cooperation. Please feel free to call me if you have any questions ( ).

Sincerely yours,

P.S. We have decided to use Smarties as rewards for D.

Letter to C.'s Parents

Dear_____,

This is just a note to let you know what behaviors the sixth-graders will be working on with C. We have decided on these six:

1. to look at the person talking to her,
2. to come when she is called,
3. to take off her sweater (or shirt),
4. to put on her sweater (or shirt),
5. to answer "yes" when asked if she wants a food treat,
6. to name objects from pictures.

We would have also liked to have worked with her answering "no" appropriately, but the program involves rewarding the behavior we want, and the result of rewarding a negative response seems questionable.

Also, it would be appreciated if you could send a bulky sweater or shirt (pull-over type) to school with C. to be used during the program.

Thank you for your cooperation. If you have any questions, please feel free to call me ( ).

Yours sincerely,

P.S. We have decided to use ice cream as C.'s reward. If this does not work we might use little pictures on cardboard, but we are afraid these might interest her more than continuing to work on a particular skill.

Letter to G.'s Parents

Dear_____,

This is just a little note to let you know what we are working on with G. in his tutoring program with the sixth-graders. We will try to teach him to put on his socks, to put on his sweater (or shirt), and to wash and dry his hands.*

To accomplish the first two goals, it would be appreciated if you could send a pair of socks (loose-fitting type) and a bulky pullover sweater or shirt to be used during the program.

Thank you for the cooperation in this matter. If you have any questions, please feel free to call me ( ).

Sincerely yours,

P.S. We have decided to use Smarties as G.'s reward.

*Two simple academic skills were added to this program after this letter was sent out. These were recognizing the numbers 1-10 and telling time (just hours).

Appendix K (continued):

Letter to J.'s Parents

Dear_____,

This is just a little note to tell you what skills we will be working on with J. We would like to teach her to recognize the letters of the alphabet, learn the numbers up to 20, and to learn the hours on the clock.

We have been advised of J.'s diet and, therefore, thought we would use little bits of graham crackers and sips of 2% milk as her treat. If J. is used to drinking skim milk, just send a little note with her to school and we will change types. I hope this is satisfactory to you.

Thank you for your cooperation, and if you have any questions, please feel free to call me ( ).

Sincerely yours,

Letter to L.'s Parents

Dear_____,

This is just a little note to let you know what behaviors we have decided to have the sixth-graders work on with L. The five we have chosen are:

1. looking at the person who is talking to her,
2. putting on her sweater (or shirt),
3. buttoning,
4. unbuttoning,
5. talking outloud at school,

It would be appreciated if you could send a bulky pullover type sweater or shirt to school with L. to use during this program. Also, we will need a sweater or shirt that has buttons (preferably larger ones with big buttonholes) to use in teaching her how to button and unbutton.

Thank you for your cooperation. If you have any questions, please feel free to call me ( ).

Sincerely yours,

P.S. We are going to try Smarties as L.'s reward.

Appendix L

Program Of Target Skills For Tutee D.

LOOK AT ME

Standing or sitting in front of child:

1. gently turn the child's head in your direction and say "Look at me".
2. lightly touching the child's chin, make turning motion and say "Look at me."
3. make turning motion and say "Look at me."
4. say "Look at me."

Standing at least 5 feet away from child:

5. make turning motion and say "Look at me."
6. say "Look at me."

STAND UP

Standing in front of seated child:

1. gently lift child by shoulders saying "Stand up".
2. lightly touching shoulders, make upward motion and say "Stand up".
3. make upward motion and say "Stand up".
4. say "Stand up".

Standing at least 5 feet away from seated child:

5. make upward motion and say "Stand up".
6. say "Stand up".

Appendix L (continued):

SIT DOWN

Child should be standing by chair:

1. gently push downward on shoulders and say "Sit down".
2. lightly touch shoulders and make downward motion saying "Sit down".
3. make a downward motion saying "Sit down".
4. say "Sit down".

Standing at least 5 feet away from child:

5. make a downward motion saying "Sit down".
6. say "Sit down".

UNBUTTON YOUR SHIRT

Put button halfway through buttonhole:

1. Put one hand on button and one hand on buttonhole side of shirt.
   Pull child's hands apart to bring button out of hole.
   Say "Unbutton your shirt".
2. Put hands in the right place again.
   Give touch to back of hands. Say "Unbutton your shirt".
3. Point to button. Say "Unbutton your shirt".
4. Say "Unbutton your sweater".

Button is all the way through the buttonhole:

5. Put hands in the right place again.
   Give a touch to the back of the hands.
   Say "Button your shirt"!!
6. Point to button. Say "Unbutton your shirt".
7. Say "Unbutton your shirt".

Appendix L (continued):

BUTTON YOUR SHIRT

Put button halfway through buttonhole:

1. Put one hand on button and one hand on buttonhole side of shirt.
   Push child's hand so that button goes through buttonhole.
   Say "Button your shirt".

2. Put hands in the right place again.
   Give touch to back of hands. Say "Button your shirt".

3. Point to button. Say "Button your shirt".

4. Say "Button your shirt".

Button is completely out of buttonhole:

5. Put hands in the right place again.
   Give a touch to the back of the hands.
   Say "Button your shirt".

6. Point to button. Say "Button your shirt".

7. Say "Button your shirt".

Appendix M

Program Of Target Skills For Tutee C.

LOOK AT ME

Standing or sitting in front of child:

1. gently turn the child's head in your direction and say "Look at me".
2. lightly touching the child's chin, making turning motion and say "Look at me".
3. make turning motion and say "Look at me".
4. say "Look at me".

Standing at least 5 feet away from child:

5. make turning motion and say "Look at me".
6. say "Look at me".

COME TO ME

Standing at arm's length from child:

1. gently tug child toward you by shoulders or arms saying "Come to me".
2. lightly touch shoulders or arms and make a forward motion saying "Come to me".
3. make a forward motion saying "Come to me".
4. say "Come to me".

Standing at least 5 feet from child:

5. make forward motion saying "Come to me".
6. say "Come to me".

TAKE YOUR SWEATER OFF

Child should be standing with sweater nearly off, over one arm up to elbow:

1. putting child's hand on sweater and helping him pull it off, say "Take your sweater off".
2. pointing to sweater say "Take your sweater off".
3. say "Take your sweater off".

Child should be standing with sweater completely over one arm.

4. pointing to sweater say "Take your sweater off".
5. say "Take your sweater off".

Child should be standing with sweater over his head and completely on.

6. putting child's hands on sweater and helping him get it over his head, say "Take your sweater off". Then, pointing to sleeves (one at a time) repeat "Take your sweater off" until sweater is completely off.
7. pointing to sweater say "Take your sweater off". Repeat until all movements are finished.
8. say "Take your sweater off". Repeat until all movements are finished.

PUT YOUR SWEATER ON

Child should be standing with sweater nearly on, one arm in sleeve and head through opening.

1. helping child put arm through sleeve, say "Put your sweater on".
2. pointing to sleeve say "Put your sweater on".
3. say "Put your sweater on".

Child should be standing with sweater over head, but both arms outside sweater.

4. pointing to sweater say "Put your sweater on".

5. say "Put your sweater on".

Child should be standing with sweater completely off:

6. putting child's hands on sweater and helping child put his head through the opening say "Put your sweater on". Then, pointing to sleeves, repeat "Put your sweater on" until sweater is completely on.

7. pointing to sweater say "Put your sweater on". Repeat until all movements are finished.

8. say "Put your sweater on". Repeat until all movements are finished.

NAMING OBJECTS FROM PICTURES (What is this?)

Show C. card with 4 pictures. C. must point to the right picture.

1. say "This is a house. Where is the house?" (Do this for all 4 pictures.)

C. must make a sound when she points to a picture:

2. say "Where's the house?" Touch her lips and say "Good, say house C."

3. say "What is this?" "A house, good. Say house, C."

4. say "What is this?"

C. must make a sound that is close to the right word:

5. say "What is this?: "Say house, C."

6. say "What is this, C.?"

ANSWERING "YES" TO A QUESTION ("SAY YES.")

C. answers "Yes".

1. You say "Do you want some ice cream C.?"

Appendix N

Program of Target Skills for Tutee G.

PUT YOUR SOCKS ON

Child should have socks on foot barely over heel.

1. Putting hands on sock and helping pull it up, say "Put your sock on."
2. Pointing to sock say "Put your sock on."
3. Say "Put your sock on."

Child should have sock just over toes.

4. Pointing to sock say "Put your sock on."
5. Say "Put your sock on."

Child should have socks off all the way.

6. Pointing at socks say "Put your socks on."
7. Say "Put your socks on."

PUT YOUR SWEATER ON

Child should be standing with sweater nearly on, one arm in sleeve and head through opening.

1. Helping child put arm through sleeve, say "Put your sweater on."
2. Pointing to sleeve say "Put your sweater on."
3. Say "Put your sweater on."

Child should be standing with sweater over head, but both arms outside sweater.

4. Pointing to sweater say "Put your sweater on."
5. Say "Put your sweater on."

Child should be standing with sweater completely off.

6. Putting child's hands on sweater and helping child put his head through the opening say "Put your sweater on." Then, pointing to sleeves, repeat "Put your sweater on" until sweater is completey on.

7. Pointing to sweater say "Put your sweater on." Repeat until all movements are finished.

8. Say "Put your sweater on." Repeat until all movements are finished.

WASH YOUR HANDS

Child is sitting before the tub with the soap hanging from the rope above.

1. Wet his hands. Rub them on the soap and then rub his fingers together. Rinse. Say "Wash your hands." Hand towel to him. Say "Now dry them." (Help him if needed.)

2. Wet his hands. Rub them on the soap and then rub them together. Point to water. Say "Wash your hands." Point to towel. Say "Now dry them."

3. Wet his hands. Rub on soap. Join his hands. Say "Wash your hands." Say "Now dry them."

4. Wet his hands. Point to soap. Say "Wash your hands." (If he stops before drying, say "What did you forget?"

5. Say "Wash your hands."

WHAT TIME IS IT?

Show child clock. Present hours in order.

1. Say "What time is it?" "It's one o'clock. Say one o'clock."

2. Say "What time is it?" "It's one o'clock. What time is it?"

3. Say "What time is it?"

Mix up the times.

4. Say "What time is it?" "It's one o'clock. What time is it?"

5. Say "What time is it?"

Appendix N (continued):

WHAT NUMBER IS THIS? (NUMBERS 1-10)

Show child numbers one at a time in order.

1. "What number is this? This is the one." Then trace it with his fingers and have him repeat "one".

2. Say "What number is this? This is a one." Trace it with his fingers then ask "What number is this?"

3. Trace it with his fingers and say "What number is this?"

Present numbers mixed up.

4. Say "What number is this? This is a one." Then trace it with his fingers and ask "What number is this?"

5. Say "What number is this? This is a one." This time do not trace. Say "What time is this?"

6. Say "What number is this?"

Appendix O

Program of Target Skills for Tutee J.

WHAT LETTER IS THIS (capitals)?

Place 3 letters of the alphabet before child on the table. (Use letters in order.)

1. Say "What letter is this?" If answer is wrong, say "This is an A. Say A."
2. Say "What letter is this?" If answer is wrong, say "This is an A. What is it?"
3. Say "What letter is this?"

Present letters out of order (still 3 at a time).

4. Say "What letter is this?" If answer is wrong, say "This is an A. What is it?"
5. Say "What letter is this?"

WHAT LETTER IS THIS (small)?

It is the same method as above, but you say "This is a little a"

WHAT NUMBER IS THIS (1-20)?

Place 4 numbers before child on table. (Use numbers in order.)

1. Say "What number is this?" If answer is wrong, say "This is a 1. Say 1."
2. Say "What number is this?" If answer is wrong, say "This is a 1. What is it?"
3. Say "What number is this?"

Appendix O (continued):

Present numbers out of order (still 4 at a time).

4. Say "What number is this?" If answer is wrong, say "This is a 1. What is it?"

5. Say "What number is this?"

WHAT TIME IS IT?

Show the clock to the child. Present hours in order.

1. Say "What time is it?" If answer is wrong, say "It's one o'clock. Say one o'clock."

2. Say "What time is it?" If answer is wrong, say "It's one o'clock. What time is it?"

3. Say "What time is it?"

Present hours out of order.

4. Say "What time is it?" If answer is wrong, say "It's one o'clock. What time is it?"

5. Say "What time is it?"

Appendix P

Program of Target Skills for Tutee L.

LOOK AT ME

Standing or sitting in front of child:

1. Gently turn the child's head in your direction and say "Look at me."
2. Lightly touching the child's chin, make turning notion and say "Look at me."
3. Make turning motion and say "Look at me."
4. Say "Look at me."

Standing at least 5 feet away from child:

5. Make turning motion and say "Look at me."
6. Say "Look at me."

PUT YOUR SWEATER ON

Child should be standing with sweater nearly on, one arm in sleeve and head through opening.

1. Helping child put arm through sleeve, say "Put your sweater on."
2. Pointing to sleeve say "Put your sweater on."
3. Say "Put your sweater on."

Child should be standing with sweater over head, but both arms outside sweater.

4. Pointing to sweater say "Put your sweater on."
5. Say "Put your sweater on."

Appendix P (continued):

Child should be standing with sweater completely off.

6. Putting child's hands on sweater and helping child put his head through the opening say "Put your sweater on." Then, pointing to sleeves, repeat "Put your sweater on" until sweater is completely on.

7. Pointing to sweater say "Put your sweater on." Repeat until all movements are finished.

8. Say "Put your sweater on." Repeat until all movements are finished.

UNBUTTONING

Put button halfway through buttonhole.

1. Put one hand on button and one hand on buttonhole side of shirt. Pull child's hands apart to bring button out of hole, say "Unbutton your sweater."

2. Put hands in the right place again. Give tough to back of hands, say "Unbutton your sweater."

3. Point to button, say "Unbutton your sweater."

4. Say "Unbutton your sweater."

Button it all the way through the buttonhole.

5. Put hands in the right place again. Give a touch to the back of the hands. Say "Unbutton your sweater."

6. Point to button, say "Unbutton your sweater."

7. Say "Unbutton your sweater."

BUTTONING

Put button halfway through buttonhole.

1. Put one hand on button and one hand on buttonhole side of sweater. Push child's hand so that button goes through buttonhole. Say "Button your sweater."

2. Put hands in the right place again. Give touch to back of hands. Say "Button your sweater."

3. Point to button. Say "Button your sweater."

4. Say "Button your sweater."

Button is completely out of buttonhole.

5. Put hands in the right place again. Give a touch to the back of the hands. Say "Button your sweater."

6. Point to button. Say "Button your sweater."

7. Say "Button your sweater."

SPEAK LOUDER

Child moves her mouth to imitate.

1. Say "Do this." (Have child imitate any one syllable sound or word.) Child makes a noise that you can hear.

2. Raise your voice, say "Speak louder." (Use same sounds as before.)

Stand 5 feet away. Child makes a noise you can hear.

3. Say "Speak louder." (Use same sounds as before.)

Child answers simple questions so that you can hear her.

4. Say "What's your name? Say _____." Say "How old are you? Say seven.", etc.

5. Say "What's your name?", etc.

(Do not use prompts as in Step 4.)

Stand 5 feet away. Child answers questions so that you can hear her.

6. (Use same questions as before.) You may say "Speak louder."

Appendix Q

Booklet Prepared for Tutees' Parents

Concerning Results of Program

Robin Hood Tutoring Program

Page 1

Child_____

Parents_____

Tutors (1) _____

(2) _____

Supervisor _____

(Department of Educational Psychology)

(Phone:_____)

Page 2

Explanation of Programs

How Set Up

Each program was determined by a questionnaire sent home to the parents and in consultation with the child's classroom teacher.

Actual Programming

Each behavior is broken down into smaller sub-behaviors. The tutors start at the first sub-behavior and reward correct behaviors. When they get 5 correct responses in a row they can proceed to the next step. Each step is progressively harder. By making the behaviors easy at first we can give lots of rewards and make learning an enjoyable task.

*Note to Parents

Your child's program follows. A circle is placed around the approximate step of each behavior your child achieved by the end of the program.

Your child received _____ as his/her reward in addition to social rewards.

Pages 2a, 2b, etc.

(The target skills with all of the substeps comprising them were listed on these pages for the tutee in question.)

Page 3

Parts of Experiment (and abbreviations)

Baseline (B1) - (1 week). During the B1 we want to see how the child performs before the program is started. The tutors try to work on the behaviors selected without using rewards.

Treatment 1 (T1) - (4 weeks). During T1 we want to see how the child performs while being systematically rewarded with social rewards and material rewards (food treats).

Baseline (B2) - (1 week). During B2 we want to check to see if the rewards are what is really causing the change in behavior, so we take away the social and food rewards to see how they perform without them.

Treatment 2 (T2) - (1 week). During T2 we want to determine if our social rewards are stronger than our food rewards, so we give social rewards but not food rewards.

Treatment 3 (T3) - (2 weeks). We return to the same procedure used in T1.

Follow-up (F) - (1 day test). This is to determine if our results will last over a period of time.

Page 4

Definitions

1. Behavior - anything we do, and act

2. Behavior modification - a technique to change or strengthen behaviors by systematically controlling the rewards accompanying behaviors

3. Learned reward - a type of reward that we have to learn is rewarding usually by pairing it with unlearned rewards (e.g., money, praise, a pat on the head, good marks).

4. Material rewards - any reward that can be seen or touched, e.g., money, food, clothes, going to the movies

5. Reward - something pleasant that people will work for

6. Social rewards - any reward that is "intrinsically" (makes us feel good) rewarding to us, usually it cannot be seen or touched, e.g., praise, saying "good work", a compliment, etc., a pat on the head.

7. Unlearned reward - a reward that is by its nature pleasing to all men, e.g., food, warmth. We do not need to "learn" that these are rewarding.

Page 5

Results

The results were recorded daily on a Daily Record Sheet (see next page). The girls took turns being the "tutor" - the actual teacher; and the "counter" - the recorder.

Summary of Main Results

1. Older children can be taught to be good tutors of other younger children. (They also are reliable recorders of data.)

2. All of the Robin Hood children progressed steadily throughout the program.

3. Two of the five children from Robin Hood had a temporary set back when rewards were not given to them. This indicates that the rewards were significantly helping them learn. This was not true of the other three, perhaps.

   (a) I did not make the no-reinforcement period (no reward period) long enough.

   (b) Any program with a one-to-one teaching set-up would work with these children.

   (c) Maybe just their natural development over 3 mos. could account for their improvement.

*NOTE: However even these 3 children did improve much faster when we started using social rewards again after a week of no rewards. Perhaps then the rewards (especially social) are important in some way to the learning situation.

Page 6

(A replica of the Daily Record Sheets was included.)

Page 7

Graph 1

Number of correct per day - Number of Incorrect per day

The total number of correct and incorrect responses was computed for each day of the program. This total correct and incorrect includes all behaviors and all sub-behaviors.

It can tell you how your child did everyday, his average amount of responses per day, and an average correct and incorrect a day could be established by this graph.

It can also indicate how consistent your child's responses were. Relatively straight lines indicate consistent behavior. Lines that "go all over" the graph indicate more inconsistent behavior.

Page 8

(The graph of Number Correct and Number of Incorrect Per Tutoring Session for the tutee in question was included.)

Page 9

Graph 2

Percentage of Correct Responses

Since the total number of responses per day varied a percent correct was computed for each day.

Despite variations in day to day to readings, a general reward trend on the graph indicates improvement.

Page 10

(The graph of Percentage Correct Per Tutoring Session for the tutee in question was included.)

Page 11

Graph 3

Cumulative Number Correct and Incorrect Responses

On this graph the total correct for each day was added on to the sum of the correct responses for all the preceeding days.

The same was done for incorrect responses.

(a) A steep slope upward on correct responses and a flat section (or not so steep a slope) on incorrect responses indicates general improvement.

(b) If correct responses are a flat line and incorrect responses rise steeply, the child is not improving.

(c) If both correct and incorrect are flat, the child is neither improving or doing badly. He has reached a stationary level.

(d) If both correct and incorrect rise steeply then it indicates that while the child is getting more right, he also is getting more wrong. This also is a period of no improvement.

NOTE: It is important to look at this graph in sections, since response patterns can change very much over a 3 month period.

Page 12

(The graph of the Cumulative Number of Correct and Incorrect Responses Per Tutoring Session for the tutee in question was included.)

Page 13

Progress Test

Periodically during the program the children were given Progress Tests. On this test the children were either scored "+" or "0" on the final behavior that we wanted from them.

If the child scored 2 out of 3 pluses for each behavior that behavior was considered learned.

Graph 4

Progress Test - Behaviors Learned (2 out of 3 pluses)

On this graph an idea of how many behaviors on which the child actually obtained the last step or final behavior can be seen.

NOTE: In looking at this graph, care should be taken not to interpret a straight line as no improvement. Some of the children improved significantly but did not as yet reach the final step in their program. This graph cannot show these fine improvements.

Page 14

(A replica of the Progress Test Form for the tutee in question was included.)

Page 15

(The graph of Progress Test for the tutee in question was included.)

Appendix R

Tables Used in the Computation of weighted Percentages Correct Responses*

Table R-1. Look at Me. Tutee D.

Weeks of Program		1		2		3 1/2		6		7		8		9		10	
		# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor
SUBSTEPS TUTORED (out of 6)	1					5											
	2			5													
	3					5	1										
	4																
	5			5	1												
	6	5	5	5		7	4	25		20		20		20		35	
Weighted Percentage Correct		50%		93%		70%		100%		100%		100%		100%		100%	

*Sample computation of weighted percentage correct using data of Week 2:

a) weighted number correct: 5 correct at substep 2 = 10; 5 correct at substep 5 = 25; 5 correct at substep 6 = 30. Weighted number correct = 10 + 25 + 30 = 65.

b) weighted number incorrect: 1 correct at substep 5 = 5. weighted number incorrect = 5

c) total weighted number of all responses = weighted number correct + weighted number incorrect = 65 + 5 = 70

d) weighted percentage correct = weighted number correct/total weighted number of all responses x 100 = 65/70 x 100 = 93%

Appendix R (continued):

Table R-2. Stand Up. Tutee D.

Weeks of Program		1		2		3 1/2		6		7		8		9		10	
		# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor
SUBSTEPS TUTORED (out of 6)	5	4	2														
	6	5	8	10	1	16	1	25	-	25	3	25	-	20	-	35	-
Weighted Percentage Correct		46%		91%		94%		100%		89%		100%		100%		100%	

Table R-3. Sit Down. Tutee D.

Weeks of Program		1		2		3 1/2		6		7		8		9		10	
		# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor
SUBSTEPS TUTORED (out of 6)	6	5	-	11	1	16	1	25	-	25	3	25	-	20	-	35	-
Weighted Percentage Correct		100%		91%		94%		100%		89%		100%		100%		100%	

Appendix R (continued):

Table R-4. Unbutton Your Shirt. Tutee D.

Weeks of Program		1		2		3 1/2		6		7		8		9		10	
		# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor
SUBSETS TUTORED (out of 6)	1	2	1														
	2					10											
	3						5										
	5					5	3										
	6			13	2	10	3	23	3	15	0	20	3	17	1	30	-
Weighted Percentage Correct		62%		87%		66%		88%		100%		87%		94%		100%	

Table R-5. Button Your Shirt. Tutee D.

Weeks of Program		1		2		3 1/2		6		7		8		9		10	
		# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor
SUBSETS TUTORED (out of 6)	1		1	7	10	10	3	11	16			21	8	16	2	5	-
	2				4	1	5	5	10								
	3				1	1	2			10	5					25	9
Weighted Percentage correct		0%		25%		44%		54%		67%		72%		89%		75%	

Appendix R (continued):

Table R-6. Look At Me. Tutee C.

Weeks of Program		1		2		3 1/2		6		7		8		9		10	
		# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor
Substeps Tutored (out of 6)	1	12	11	11		14	3	5		5		18	1	5	1	5	3
	2	6	8	5	5	2				1	5						
Weighted Percentage Correct		49%		69%		86%		100%		42%		95%		83%		63%	

Table R-7. Come To Me. Tutee C.

Weeks of Program		1		2		3 1/2		6		7		8		9		10	
		# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor
Substeps Tutored (out of 6)	1	13		28	6	10		10		10		25		10		10	
	2	8	15	10	22	10	7	9	2	7	7	27	4	15		10	
	3	9	5	5	5			3	5		2	3	8	9	1	9	2
Weighted Percentage Correct		55%		49%		68%		71%		63%		73%		95%		90%	

Appendix R (continued):

Table R-8. Take Your Sweater Off. Tutee C.

Weeks of Program		1		2		3 1/2		6		7		8		9		10	
		# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor
SUBSTEPS TUTORED (out of 8)	1			2		5											
	2					5											
	3					5											
	4					5											
	5					7											
	6											2				2	
Weighted Percentage Correct		no data		100%		100%		no data		no data		100%		100%		100%	

Appendix R (continued):

Table R-9. Put Your Sweater On. Tutee C.

Weeks of Program		1		2		3 1/2		6		7		8		9		10	
		# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor
SUBSTEPS TUTORED (out of 8)	1							5									
	2							5									
	3							5									
	4							7									
	5							1									
	6									2							
	7										1						
	8									1	5	3					
Weighted Percentage Correct		no data		no data		no data		100%		30%		100%		no data		no data	

Appendix R (continued):

Table R-10. What is This? Tutee C.

Weeks of Program		1		2		3 1/2		6		7		8		9		10	
		# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor
SUBSTEPS TUTORED (out of 6)	1	24	7													15	
	2	12	4	15	4	4	7					5		2	5	11	3
	3	10	4	1	3							5					
	4	5	5									1					
Weighted Percentage Correct		67%		66%		36%		no data		no data		100%		29%		86%	

Table R-11. Say "Yes". Tutee C.

Weeks of Program		1		2		3 1/2		6		7		8		9		10	
		# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor
SUBSTEPS TUTORED (out of 1)	1	4	13	6	4												5
Weighted Percentage Correct		23%		60%		no data		no data		no data		no data		no data		0%	

Appendix R (continued):

Table R-12. Put On Your Socks. Tutee G.*

Weeks of Program		1		2		3 1/2		6		7		8		9		10	
		# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor
SUBSTEPS TUTORED (out of 7)	1	6										2					
Weighted Percentage Correct		100%		no data		no data		no data		no data		100%		no data		no data	

*There were no data for Tutee G. on the target skills "Put on your sweater" and "Wash your hands." Therefore, they are not included in Appendix R.

Table R-13. What Number Is This (1-10)? Tutee G.

Weeks of Program		1		2		3 1/2		6		7		8		9		10	
		# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor
SUBSTEPS TUTORED (out of 6)	1	44	2	5	5	13	8	24	6	10		19	1	10			
	2	10	18	34	34	12	6	21	9								
	3			1	2	19	10	5	5	19	12	32	20	21	10	28	12
	4					2	3										
Weighted Percentage Correct		63%		49%		62%		67%		65%		65%		71%		70%	

Appendix R (continued):

Table R-14. What Time Is It? Tutee G.

Weeks of Program		1		2		3 1/2		6		7		8		9		10	
		# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor
SUBSTEPS TUTORED (out of 5)	1	3	13	7	19	15	13	25	13	15	8	29	7	20	4	10	2
	2									5	6						
	3							1	4	1	5	11	8	12		24	
Weighted Percentage Correct		19%		27%		53%		53%		44%		67%		93%		98%	

Table R-15. What Letter Is This (capitals)? Tutee J.

Weeks of Program		1		2		3 1/2		6		7		8		9		10	
		# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor
SUBSTEPS TUTORED* (out of 5)	5	26	11	32	8	22	4	8	1	24		37	1	8		25	1
Weighted Percentage Correct		70%		80%		85%		89%		100%		97%		100%		96%	

*Since Tutee J. already exhibited the target skill at a high degree of competence, only responses that were rated as the final behavior (highest substep) were socred as correct. Therefore, each percentage has a weight of 5, since this was the highest substep for each target skill in J.'s program.

Appendix R (continued):

Table R-16. What Letter Is This (small)? Tutee J.

Weeks of Program		1		2		3 1/2		6		7		8		9		10	
		# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor
SUBSTEPS TUTORED* (out of 5)	5	9	7	32	5	14	4	14	4	22	3	37	1	8		23	
Weighted Percentage Correct		56%		86%		77%		77%		88%		97%		100%		100%	

Table R-17. What Number Is This (1-20)? Tutee J.

Weeks of Program		1		2		3 1/2		6		7		8		9		10	
		# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor
SUBSTEPS TUTORED* (out of 5)	5	16	5	3	4	8		7		17	1	16	1	2	1	8	9
Weighted Percentage Correct		76%		43%		100%		100%		94%		94%		67%		89%	

Appendix R (continued):

Table R-18. What Time Is It? Tutee J.

Weeks of Program		1		2		3 1/2		6		7		8		9		10	
		# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor
SUBSTEPS TUTORED* (out of 5)	5	68	3	18		10	2	23	1	27		52		12		35	
Weighted Percentage Correct		96%		100%		83%		98%		100%		100%		100%		100%	

Table R-19. Look At Me. Tutee L.

Weeks of Program		1		2		3 1/2		6		7		8		9		10	
		# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor
SUBSTEPS TUTORED (out of 6)	1	9	1	11													
	2	13	7	5													
	3	5		7													
	4	5		5													
	5	8	2														
	6	3	2					5				5					
Weighted Percentage Correct		77%		100%		no data		100%		no data		100%		no data		no data	

Appendix R (continued):

Table R-20. Put Your Sweater On. Tutee L.

Weeks of Program		1		2		3 1/2		6		7		8		9		10	
		# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor
SUBSTEPS TUTORED (out of 8)	1					5		5									
	2					5			2								
	3					1											
Weighted Percentage Correct		no data		no data		100%		55%		no data		51%		no data		no data	

Table R-21. Unbutton Your Sweater. Tutee L.

Weeks of Program		1		2		3 1/2		6		7		8		9		10	
		# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor
SUBSTEPS TUTORED (out of 7)	1	1	9	5				5								5	
	2			7	1			12		5						5	
	3							7	2	2	1					5	
Weighted Percentage Correct		10%		90%		no data		89%		84%		no data		no data		100%	

Appendix R (continued):

Table R-22. Button Your Sweater.* Tutee L.

Weeks of Program		1		2		3 1/2		6		7		8		9		10	
		# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor
SUBSTEPS TUTORED (out of 7)	1									5							
	2										5						
Weighted Percentage Correct		no data		no data		no data		no data		33%		no data		no data		no data	

*Due to the lack of data, no graph of the weighted percentages correct is included in the text for this target skill.

Table R-23. Speak Louder. Tutee L.

Weeks of Program		1		2		3 1/2		6		7		8		9		10	
		# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor	# Cor	# Incor
SUBSTEPS TUTORED (out of 6)	1	4	1	8	14	11	2									10	
	2	5		4		8	8	4	14	4	6	18	2	6		40	
	3	4	1			4	6					22	2	11		10	
	4	1	4									8	1	10		11	
	5											10				3	2
	6											1	1				
Weighted Percentage Correct		60%		53%		54%		22%		45%		90%		100%		95%	

Appendix S

Statements Made by Tutors Concerning the Tutoring Project

"I liked helping other people (especially D.)."

"I liked talking with the children."

"I liked making them (the children) happy."

"I liked (Tutee) D."

"I liked meeting _____" (the experimenter and her husband).

"I liked going horseback riding;" "going to _____ house" (the experimenter's); "going on hikes," "the parties we had." (All these refer to specific rewards on the token system for the tutors.)

"I liked to teach the children and get rewards."

"I liked to eat with the children and know what they do."

"I liked helping _____ with her experiment" (the experimenter).

"I liked working with (Tutee) G." (This response occurred twice.)

"I liked rewards every 50 points."

"I liked rewards."

"I liked the people because it was fun working with them."

"I learned how to help the child."

"I learned retarded children need effections (sic) from everyone."

"The program helped me learn what it is like being mental."

"I learned how social rewards worked."

"I learned how to teach."

"I learned how rewards help us learn things."

"It was an interesting experiment."